

JOURNAL CIBSE



The official magazine of the Chartered Institution of Building Services Engineers

May 2010

DOWNTURN BITES

Young engineers are hit by redundancy

NEW DELIVERY MAN

The views of CIBSE's incoming president

AFTER THE ELECTION

What the three main parties have in store



Can BREEAM take the LEED?

Top two environmental standards battle it out



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Cover image of MediaCity, Salford, UK, credited under the BREEAM Communities scheme: Courtesy of Peel Media



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From the editor



Don't neglect those green shoots

It comes as little surprise that the recession has led to a wave of redundancies, with younger engineers being among those feeling the brunt of job cutbacks. As our interviews with young professionals underline (page 43), if they are victims of cutbacks they then face the prospect of trying to get back into employment but being turned down due to lack of experience.

The wider concern, though, is that the building services engineering (BSE) sector could become the victim of a self-inflicted double-whammy. Amid the downturn, companies are losing young blood whose talents are needed to take them and the profession as a whole forward with fresh ideas and ambition. When the sector then needs to start recruiting again, it may find that many of those who were 'let go' have gone elsewhere.

Moreover, youngsters who are unsure which engineering undergraduate studies to pursue will be even more reluctant to go for the BSE sector than they already are. And those BSE courses, already few in number, will feel the knock-on effects.

As our annual jobs survey shows (page 46, and Letters, page 24), BSE professionals are increasingly eyeing other related sectors, such as energy and power – in effect, they are looking at jumping the energy-demand ship to join the energy-supply supertanker. It is not only the utilities that are attracting our young professionals – the realm of energy efficiency assessments also offers new job opportunities.

The jobs survey, conducted by recruitment consultancy Hays, also suggests that it is not

just job insecurity but also depressed wages that could be driving BSE professionals away. Again, it's no surprise to learn that salaries in the sector have been largely static in the past year. This is an inevitable outcome in a recession, when firms' fees and margins are squeezed ever harder. But it could also turn out to be very short-sighted for firms that depend on new entrants to feed through to higher-level roles when the baby-boomers are retiring in their droves.

In her opinion column, young engineer Morwenna Wilson makes a powerful case for encouraging the present generation of young

BSE professionals to take the green-buildings agenda forward (page 26). This generation has an opportunity to succeed where previous ones have not – in pushing for integrated project teams and collaboration across the supply chain to try to ensure that buildings deliver on their design intentions.

This is not to say that seasoned professionals

from an earlier generation aren't vigorously pursuing the same agenda. Of course they are – as our interview with the incoming CIBSE president Rob Manning testifies (page 34). But it is the BSE directors of the future who will be charged with delivering on the green agenda – and, in failing to keep and nurture this enthusiastic young talent, the present generation of senior engineers could one day find themselves accused of letting down the whole profession.

Bob Cervi, Editor
bcervi@cibsejournal.com

By failing to nurture new talent, senior engineers could find themselves accused of letting down the whole profession

News in Brief

University cuts

The Association of University Directors of Estates said institutions are planning for the worst following the UK government's decision to cut capital grants by more than £500m. Overall capital funding for 2010-11 has been cut from £938m to £404m – a 14.9 per cent reduction after £250m was brought forward from 2010-11 into 2008-09 and 2009-10.

Home starts rise

The value of residential build projects starting on site during the three months to March 2010 in the private and social housing sectors was 37 per cent higher than the same period a year ago, according to the latest Glenigan Index. The value of non-residential construction project starts was only two per cent lower than the same period a year ago.

Millions more for homes

An extra £24m of government funding has been made available to build 600 new affordable homes in the east of England, as well as nearly £5m under round two of the Kickstart scheme to get stalled developments back on track. This brings the government's financial support to £300m since June last year.

Beatty wins Hartlepool BSF

Infrastructure group Balfour Beatty has been awarded the initial £95m Hartlepool Building Schools for the Future (BSF) programme by Hartlepool Borough Council. The contract involves the rebuilding and replacement of six schools over the next five years. Construction of the initial sample school, Dyke House Sports and Technology College, will begin this summer.

TB rises in poor housing

The charity ARCHIVE (Architecture for Health in Vulnerable Environments) is urging architects to work with it and Brent NHS to help tackle rising cases of TB. Occupancy density, room volume and air change rates have all been found to be directly linked to the number of new TB infections.

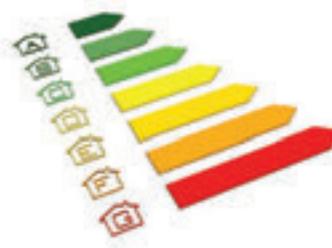
New homes are failing to get higher EPC ratings...

Around 10 per cent of new dwellings and home extensions are not achieving the best ratings for energy efficiency, according to government figures.

A total of 743 homes with some element of new construction since April 2008 have gained a top-level A rating on their energy performance certificate (EPC), while about 270,000 have either a B or C rating, according to government. The remainder – around 30,000 – fall into the lower D, E, F and G categories.

The figures were revealed last month by junior housing minister Ian Austin, in answer to a parliamentary question.

However, a spokeswoman for the Department for Communities and



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say what percentage of the total is represented by such projects.

Hywel Davies, CIBSE technical director, said the fact that the figures do not differentiate between new-build and conversions/extensions posed questions over the effectiveness of enforcement of EPC ratings.

'To a certain extent we are swimming in treacle if we are not able to break these figures down properly – as they are, putting new builds and improvements in the same basket, they are fairly meaningless,' he said.

Among existing dwellings that have been EPC-tested because they were either being sold or rented, less than 35 per cent fell into band C or above.

Local Government stressed that the total figure of 300,000 dwellings includes older houses that have been improved or extended, with the EPC relating to the house as a whole – so a house's overall rating may be below band C even if the new construction is of the highest quality.

At present it is not possible to

... as certificates still need improving

A lack of appetite for energy efficiency in the domestic market has been identified as a major barrier to adding value to sustainable homes.

The value attached to energy-efficient homes is linked to demand and there is currently little demand in the market place for energy-efficient housing, according to a new report from the Royal Institute of

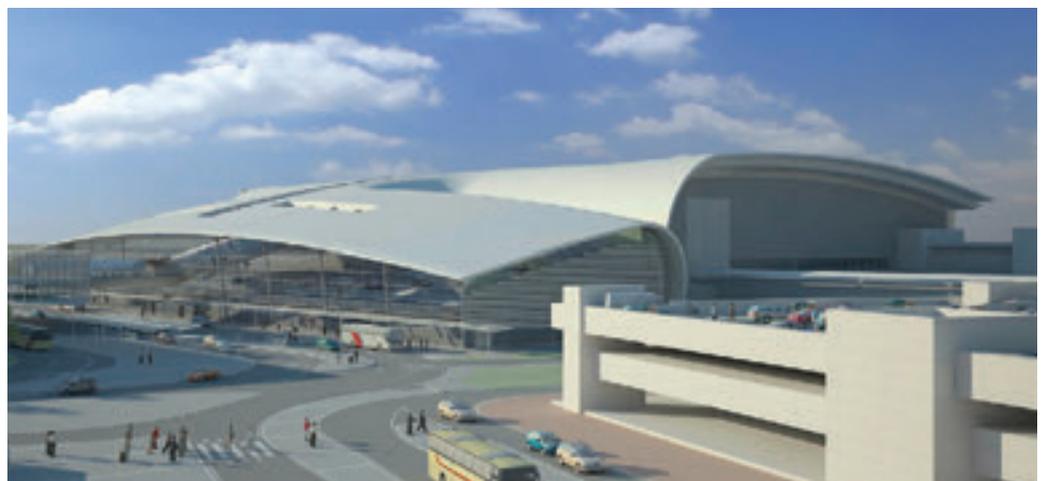
Chartered Surveyors (RICS). This is largely due to a lack of information, driving such a demand from buyers.

The RICS report concludes that the quality and relevance of energy performance certificates (EPCs) needs to be improved to make them understandable and relevant to consumers.

It also says that the market generally needs better skills and

guidance to improve the quality of EPCs, as well as recommending that information about EPCs be made more widely available to the public.

The report, *Energy Efficiency and Value Project*, was commissioned by the Department for Communities and Local Government and initiated as part of the government's Heat and Energy Savings Strategy. www.rics.org



Dublin Airport's terminal 2 gets ready to fly

Terminal 2, the flagship project of the €2bn redevelopment of Dublin Airport, is expected to open in November 2010. The new €600m terminal is regarded as one of Ireland's most prestigious construction projects to date, and will enable the airport to handle an extra 15m passengers a year. Mercury Engineering carried out the complete electrical, mechanical, IT and sprinkler installation.

Tories pledge to consult fully on building regs

A Conservative government would not proceed with plans to cut back on the Building Regulations before it had conducted a 'thorough' consultation with industry, the *Journal* has learned.

The Tories confirmed in their recent Energy Green Paper that they believed the regulations were 'prescriptive and overly complex', and would need to be 'simplified and reduced, with a focus on outcomes'.

The regulations are not discussed in the party's election manifesto, but its climate change spokesman, Greg Barker, told the *Journal* a Tory government would seek the advice of the industry before taking action.

'This is an issue which requires proper and thorough consultation with the whole housing and construction industry,' Barker said.

'We would look to reform the Building Regulations with the help and guidance of those who know best the implications of these



Terry Dix... regs not overly bureaucratic.

regulations.' Industry experts welcome the consultation plan but questioned the claim that the regulations are overly bureaucratic.

'I have not seen any hard evidence that this is the case,' said Terry Dix, a director at consultancy Arup who was involved in the redrafting of Part L of the regulations.

'The Building Regulations have for more than 20 years provided

re-enforcement to government standards and have helped to reduce the UK carbon footprint over that period.'

Hywel Davies, technical director of CIBSE, said: 'It's good to see that the Conservatives foresee a role for the Building Regulations in greening our housing stock.

'If they form the next government, CIBSE would want to encourage them to focus on how to improve levels of compliance with the regulations to achieve that in practice, and would look forward to contributing to such a consultation.'

Barker also told the *Journal* that, under its proposed Green Deal, it would seek to involve 'major high street names in retail and DIY' to help provide efficiency improvements to homes.

See our analysis of the main party manifestos, page 18. Plus: CIBSE launches a campaign to enforce compliance with air conditioning and F-gas inspections, page 20.

Industry backs Part L changes, says CLG

Many industry professionals responding to the UK government's consultation on Parts L and F of the Building Regulations 2010 agreed with the proposals.

The Department for Communities and Local Government (CLG) published the results on its website after receiving more than 400 responses.

Key findings include: 58 per cent of respondents preferred the flat-rate approach for the target emission rate (TER) for dwellings; 63 per cent preferred the aggregate approach for non-domestic buildings; and 81 per cent supported the CLG's proposal to introduce a 25 per cent reduction target. To find out more on the industry's response, visit www.communities.gov.uk

The technical guidance (Approved Documents and Compliance Guides) were expected to be published before the general election on May 6. They should be available to view at www.planningportal.gov.uk

The regulations are expected to come into force in October.

Disgruntled staff eye other industries

Almost three-quarters of professionals in key parts of the construction industry have received no salary increase in the past year, according to the annual *CIBSE Journal/Hays jobs survey*.

The survey of consulting engineers, M&E managers and estimators found that 72 per cent did not receive any salary rise and 69 per cent feel that salaries are too low.

Possibly as a result of the depressed pay levels, many professionals said they were looking to move out of the building services engineering sector – 35 per cent said they planned to move to another, related sector such as the energy industry.

Mike McNally of recruitment consultancy Hays said the static nature of the BSE profession meant there

would probably be more staff movement in the coming year. **See the survey analysis on page 46. For the full data, visit www.jobs.cibsejournal.com**



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www.stratalondon.com

Tower block power is a breeze

The wind turbines at Strata SE1, London's tallest residential tower, have now been installed. The three five-bladed nine-metre diameter wind turbines are a world first, being integrated into the fabric of the building. It is anticipated that they will produce 50MWh of electricity per year for the landlord's supply, around eight per cent of Strata SE1's estimated total energy consumption. The project has been designed by BFLS architects, and Brookfield Europe is the developer and contractor.

www.stratalondon.com

News in Brief

Lessons needed on new playground design

School playing areas are lagging behind buildings when it comes to good design, according to the Commission for Architecture and the Built Environment (CABE). Despite the improved standards for new and proposed school buildings, CABE believes play areas are often uninspiring and fail to recognise the varying needs and ages of different pupils. School grounds are one of the 10 criteria used by CABE to assess design quality in the Building Schools for the Future programme. www.cabe.org.uk

Scottish hopes for housing 'kick-start' gain momentum

The Scottish government and the Scottish Futures Trust are working closely with a number of local authorities to develop proposals for a National Housing Trust (NHT). The scheme is expected to keep people in jobs by allowing housebuilders to kick-start construction on stalled sites that would otherwise remain mothballed. About 1,000 homes are likely to be made available through the NHT, although the final number of homes provided will depend on the results of an open procurement process. www.scotland.gov.uk

Passivhaus bodies merge

The Passivhaus Buildings Trust and the Passivhaus Buildings Association have been merged to form the Passivhaus Trust, which is owned by sustainable building association, the AECB. The trust aims to create a centre of excellence for low energy and low carbon buildings. www.aecb.net

Community heating hotspots

Coventry, Nottingham and Leeds are to share an additional £4.8m in funding from the Homes and Communities Agency (HCA) for decentralised community heating schemes. Originally, £21m was announced for 13 projects to provide heat and power to homes, shops and businesses through low-carbon community heating networks. The money came from the HCA's Low Carbon Infrastructure Fund.

'Core' design standards for affordable homes

Plans for minimum design standards for affordable homes have been set out by a regeneration agency for England.

The Homes and Communities Agency (HCA) has launched a consultation into its potential future design and sustainability 'core' housing standards.

The consultation, which closes on 17 June, seeks to determine exactly what good design means in practical terms and how a simple, clear and transparent set of standards can achieve this.

It is hoped the results will eventually provide the market with clarity and consistency in constructing new homes.

According to the consultation document, lower running costs are part of the HCA's vision for better designed homes, but residents should not become burdened by design solutions that are too expensive to maintain, too sophisticated to run or which are not properly tried and tested.

The document also sets out the HCA's intention to make level four of the Code for Sustainable Homes part of its new core standards. At present, housing developments work to a minimum standard of code level 3.

The HCA is also seeking views on whether to retain the current



Future homes that have HCA involvement could have to apply stricter core standards.

minimum space standards, and has created a 'housing quality calculator' for consultants, developers and local authorities to find out how proposed new developments compare with the HCA's core standards.

If adopted, the HCA proposes that its core standards will apply to new build, general needs, non-specialised housing where the HCA

is involved via a grant scheme, providing free or discounted land, or funding major infrastructure investment as part of a regeneration project. Subject to the outcomes of the consultation and ministerial approvals, the HCA plans to publish the final standards in autumn 2010, with the standards potentially in use from April 2011.

www.homesandcommunities.co.uk

Martine Hamilton Knight

**BDP does an 'ACE' job**

This year's winners of the ACE (Association for Consultancy and Engineering) Engineering Excellence Awards have been announced. The awards showcase consultancy and engineering firms that demonstrate a high degree of achievement, value and engineering excellence. Multidisciplinary consultancy BDP won the *building structures (medium firm)* category for its own Manchester Studio (pictured). www.acenet.co.uk

Departments 'pioneer' the low carbon way

The UK government has claimed a world first, publishing plans that set out how every major department should address climate change.

The Carbon Reduction Delivery and Adaptation Plans detail each department's commitment to minimise the damage of climate change, by reducing emissions and by preparing for inevitable change in the UK climate. The plans include green infrastructure in urban areas; flood risk; and adapting skills in areas such as engineering, planning and architecture, as well as in the development of new products and services.

The Intergovernmental Panel on Climate Change highlights that countries will experience further warming over at least the next 30-40 years. In the UK we are likely to see warmer, wetter winters and hotter drier summers with increased risk of coastal erosion and severe weather.

Environment Secretary Hilary Benn said: 'These plans demonstrate how each individual department will work to reduce emissions and adapt their own estates, operations and policies.'

Meanwhile, housing minister John Healey has announced £263m of additional funding for

new affordable homes and to kick-start stalled developments, and confirmed that three new publicly owned sites are to be made available for housebuilding under the Public Land Initiative.

Eight companies and their collaborative partners have been given grants by the Department of Energy and Climate Change to explore smart technology. The grants are part of the UK's plan to move to smarter energy supplies, including smart meters in every home, a smart grid and entire smart cities. The projects are spread across a range of various technologies.

Fire safety warning



A fire expert is reminding industry of the importance of having complete fire safety strategies in place following the death of two firefighters in a Southampton blaze.

The two men were killed tackling the fire in a high rise block of flats at Shirley Towers. The tragedy echoes that at Lakanal House in south London last July.

Peter Stephenson, associate director of Kingfell Consulting, said: 'This and other recent tragic fire incidents will remind everyone working within the built environment of the importance of ensuring a complete fire safety strategy for a building, from its initial inception, through to design, construction, occupation and eventually demolition.'

'We are all aware that a fire can occur at any time and the fire safety systems incorporated into a building design need to be adequately maintained and assessed to ensure their correct operation in an emergency scenario to adequately protect the occupants and emergency responders.'

An investigation into the blaze is continuing.

A first for BREEAM NL

The first BREEAM NL certificate ratings have been awarded to projects in the Netherlands. Schiphol Real Estate's TransPort office building (pictured) and a new logistics park by developer WDP in Tilburg are the first to receive the standard. The ratings, issued by the Dutch Green Building Council under licence from BRE Global, are the first to be issued by a scheme operator outside the UK.



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TSB offers funding for building evaluations

The government is to make cash available to help develop projects for evaluating the performance of buildings.

The initiative is among a number of 'competitions' for funding being run by the Technology Strategy Board (TSB).

Firms developing ideas for 'smart' energy meters and grids are also able to compete for cash.

These two are among five technology areas being targeted by the TSB, which is offering a total funding pot of £30m.

The competitions, due to open this month and next, also aim to increase the speed at which new innovations along the energy supply chain can enter the market.

Iain Gray, chief executive, said: 'Our programme of investment is already paying dividends for the UK, with many of the companies that we have supported moving through

The competitions open this month.



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the innovation process and getting ready to take their new products to market.

'This spring's investments will build on our ongoing programme of support for UK business.'

The other three competition

areas are: building performance evaluation; design for future climate; nuclear power technology; economic and business modelling; social and behavioural studies; and smart meters and smart grids.

www.innovateuk.org

Schools' zero carbon target doubted

It will not be possible to deliver zero carbon schools across the board from 2016, the Zero Carbon Task Force (ZCTF) has concluded.

The ZCTF's final report, Road to zero carbon, found that the three-to four-year construction cycles for new schools are too long to overcome the technical, financial and social challenges that need to be addressed to deliver zero carbon schools across the board from 2016.

In order to meet the challenge, ZCTF recommends that at least four pilot zero carbon schools should be operational in each government region before 2016; a series of step-changes towards zero carbon new schools should be introduced; and processes should be set up to ensure that energy and carbon are a priority from inception to operation.

www.teachernet.gov.uk



"As an NICEIC Partner we get great technical advice and support which saved Southwark Council and its council tax payers thousands in 2009. By the end of 2010 the total saving for Southwark will be more than £700,000!"

Chris Baxter
Head of Engineering Services, Southwark Council



Firms still investing despite downturn

A study of architectural and engineering firms has found that many are looking to invest in new technology and skills despite the downturn.

The report, *Thriving in 2010 and Beyond*, surveyed 326 senior people

across these sectors to find out how they are using the economic slowdown to invest, learn and consolidate.

The report, commissioned by software firm Deltek, shows a sector still in shock after the punishing

economic conditions of 2009 and still unsure as to how a new post-boom era will pan out – and where its opportunities lie.

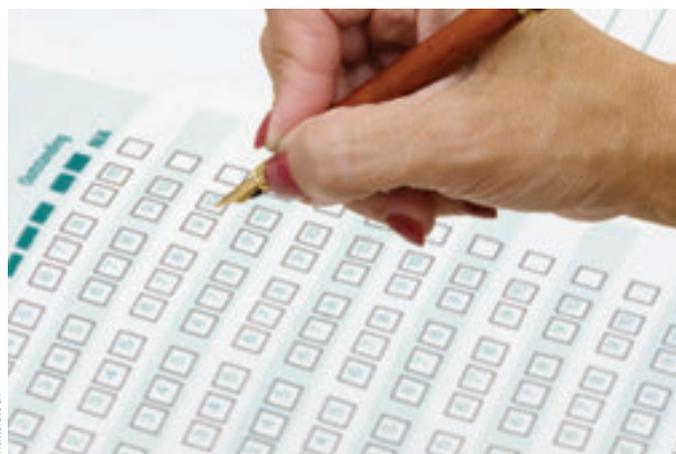
About 90 per cent thought existing practices would need to be more agile to survive – and business skills were rated as more important than design skills in defining the qualities of a top professional.

Some 32 per cent of respondents thought that refurbishment projects to bring old buildings up to current environmental standards could be a major source of future work, while 75 per cent thought the continuing globalisation of the industry was either 'essential' or 'quite important' for survival.

Only 13 per cent said that they would not be investing in new technology this year.

www.thrivingreports.com

See jobs survey feature, page 46



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Lighting up 2011

Entries are being sought for the 2011 Young Lighter of the Year competition, organised by the Society of Light and Lighting (SLL).

The competition provides a unique platform for young lighters aged under 30 – whether they be SLL members or not – to hone their presentation skills on a lighting topic of their choice. Prizes include free SLL membership for one year, an undisclosed cash sum, a certificate and a free lighting publication.

Entries may be based on previously prepared work and must be capable of being presented in 15 minutes at the final.

The deadline for applications is 21 June 2010. Finalists will present their papers in London on 12 January 2011.

For an application form contact Liz Peck on 020 8772 3622 or email lpeck@cibse.org

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News in brief

Subscription reminder

Members are reminded that payment of subscriptions was due on 1 January 2010. Those who have not yet paid risk their membership being lapsed, and therefore will no longer receive the benefits of membership. To renew, please enter your details online at www.cibse.org or contact the subscriptions team on 0208 772 3621/3691, or email golateju@cibse.org or skamal@cibse.org

City walk planned

The successful annual City Walk, run by the Society of Façade Engineering, will take place on 10 June. The event will start with two technical presentations followed by the walk, which this year will be around the Holborn area of London, looking at new and old façades. Visit www.cibse.org/sfe

New addition to CIBSE bookshop

Another book has joined the shelves at the CIBSE bookshop.

The *Colour, Light and Contrast Manual: Designing and Managing Inclusive Built Environments*, is endorsed by the Society of Light and Lighting and offers comprehensive guidance on how colour, light and contrast can be incorporated within buildings to enhance their usability. It is suitable for professionals involved in the design or management of new and existing environments, priced at £39.99 for members and £49.99 for non-members.

Details of the CIBSE Book of the Month and special offers – including 10 per cent off CIBSE books until the end of July – can be found in the new bookshop e-newsletter. Make sure we have your up-to-date email address so you don't miss out.

Visit www.cibse.org/publications or call 020 8772 3618.

Don't do politics? Engineering IS politics!

Pick up any newspaper, listen to any media and, in the UK anyway, all the talk is about the imminent general election. It is a great privilege to live within a democracy and it gives us many freedoms and choices on how we live our lives. Yet, as I write this, I can hear a small voice deep inside my consciousness: 'We may have rights, but we also have responsibilities.'

As professionals within a democracy, we clearly do have responsibilities to society – to apply our art and science to benefit others. But what about politics? I would argue that apathy is a cop-out. All of us have opinions,

hopefully backed up with cogent argument – so, by definition, if you have an opinion you do politics!

Politics and engineering are not new bedfellows. Any knowledge of Isambard Brunel with his breathtaking, visionary engineering projects, some of which were less than successful, will know that he engaged fully with the political class of the day. Much of his time was spent not engineering but influencing politicians and the public to support and endorse his work.

At about the same time, in 1860, it took parliament just 18 days to vote the funds across for Joseph Bazalgette to implement his

London sewerage system to solve the 'great stink'. I think there are plenty of historical precedents to galvanise us into action and 'do politics'.

So, when a prospective parliamentary candidate knocks on your front door, have your views at the ready. If you get a tweet or email seeking your vote – get engaged. There is no shortage of issues for us engineers to get excited about. Your institution has a view, do you? I would commend the recently launched Construction Industry Council manifesto to you. Let us all do politics! www.cic.org.uk
Stephen Matthews
Chief executive

Merseyside and North Wales Young Engineers Network – an update

The Merseyside and North Wales Young Engineers Network (YEN) has been busy since its formation in April 2009.

Together with help from the regional chairman Steve Hunt, five young engineers launched the new regional YEN group. Once formed, they agreed their mission statement, enabling them to have a clear view of the group's aims, which include commitments to:

- Provide a forum and support network for young engineers;
- Provide a platform for new thinking, and knowledge exchange;
- Ensure that young engineers engage more closely with our professional institution at an early stage in their careers;
- Encourage more women to join building services; and
- Promote building services engineering to school and university students.

As all the founding members were graduates of either a 'pure' electrical or mechanical



Merseyside and North Wales YEN promote building services in Liverpool.

engineering degree, they decided that one of their main aims would be to promote the building services industry to students at university.

Finding out that the University of Liverpool – the same university three members had graduated from – was holding an 'Engineering in the limelight' recruitment fair, they arranged to represent CIBSE at the event, giving students the information that hadn't been available to them previously. With promotional material from CIBSE

HQ and significant support from the regional committee, they were able to explain to students what the building services industry entailed and why it is so important.

The regional network is now looking to expand its membership and encourage fellow young engineers to bring new ideas to the group, and hopes to hold both social and technical events across the coming year.

Visit www.cibse-mnw-yen.org, or email cibse_yen_mnw@live.com

Key issues driving the agenda

CIBSE has just published a concise set of key issues to help drive the agenda for a more sustainable building stock.

The issues, which underpin CIBSE's day-to-day activity and drive our communications, cover two themes. Firstly, **delivering a working, low-carbon built environment:**

- Refurbishment of existing buildings – CIBSE will be working to make increased levels of information available to the industry on how to refurbish buildings efficiently;
- Achieving legislative compliance – European and UK building regulations are key to creating a more sustainable building stock. However, these regulations are useless if they are not enforced;
- The importance of real, measured energy performance data – for



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building owners and operators to be able to meet legislation demands, to record energy consumption and access and use that information is essential;

- Building operational engineering – knowledgeable operational engineers are central to the delivery of a low-carbon built environment, and so CIBSE will continue to update and increase the information offered to them; and
- Realistic, clear objectives – terms such as zero carbon must have a clear definition that is understood

and communicated concisely to the right people at the right time, avoiding overloading building owners and operators with too much legislation.

Secondly, **delivering effective, low carbon engineers:**

- Skills for the future – meeting targets for zero carbon buildings will rely on a highly skilled workforce, demanding efforts by government and educational establishments to ensure skills are developed where required;
- Design team collaboration – increased integration between design and build teams will be essential, involving building services from the outset; and
- Engineering excellence – we believe this should run through everything that we do.

To read the key issues in full, visit www.cibse.org

Graduate survey results revealed

Results are now in from the first CIBSE graduate member survey.

We received a fantastic response and the results will help us better understand what we are doing right, and what can be improved.

Respondents rated the *CIBSE Journal*, CIBSE publications, CIBSE website downloads and CPD opportunities as the top four 'most useful' benefits of membership.

We were also pleased to see that 70 per cent of members have employers who highly value your CIBSE membership. Also,

97 per cent of you felt you lacked skills in some areas when starting work in the industry, such as building regulations or project management. In response, CIBSE Training is offering all current and future graduate members a £50 voucher for Mid-Career College courses or CIBSE's Flexible Learning Modules; details will be emailed shortly. To see the great range of courses available visit www.cibsetraining.co.uk

Another result revealed that 96 per cent want to progress

their membership to become qualified, which was supported by an overall trend that called for more structured support to achieve professional registration.

CIBSE will use your feedback to help revitalise your membership. We are looking into options to develop better online resources and support to help you achieve your career goal – so stay tuned.

To read the survey results in full, visit www.cibseyoungmembers.co.uk/graduates/graduate-membership

CIBSE 2010 Low Carbon Yacht Rally

The Southern Region Low Carbon Yacht Rally will take place on Saturday 26 June in Portsmouth. The event, open to anyone working within building services, will challenge participants to round the Nab Tower using only renewable energy. The rally will be followed by a dinner and prize giving, held on the viewing platform of Portsmouth's Spinnaker Tower, offering spectacular views of the area. To register and for more information contact d.pope@popeconsulting.co.uk

Apprentice partnership agreed

CIBSE has signed a partnership agreement with Building Engineering Services Training (BEST), enabling institution membership for people taking apprenticeships and following the NVQ path. This will allow those on the Advanced Modern Apprentices course to join CIBSE as student members and subsequently to follow Licentiate EngTech registration.

BEST facilitates Advanced Modern Apprenticeship and adult worker training/qualification programmes, funded by the government. The apprenticeship programmes enable those with

building services engineering skills to gain training and essential work experience while studying at NVQ level 2 or 3 in a relevant subject.

For the first time there will be a clear pathway linking the apprentices into membership, so they can then develop their skills against the competencies set out for Licentiate EngTech – thereby encouraging the apprentice towards a structured career path.

Registration at the EngTech level with the Engineering Council, and Licentiate Membership with CIBSE, will be met through an individual case procedure. For more information visit www.cibse.org

Training and development

Submissions

The closing date for annual submissions to be considered at the July 2010 Training and Development Panel meeting is 8 June.

Training submissions and any queries, plus employers' enquiries and applications for approved company training schemes, should be addressed to Parvin Begum, training and development administrator, on 020 8772 3612 or e-mail pbegum@cibse.org

CPD Directory update

To be added to the Directory of CPD Course Providers, contact Parvin Begum, on 020 8772 3612 or email pbegum@cibse.org

We also accept applications for online courses and we will welcome more e-learning applications.

A concessionary rate is available for entries into some categories.

New companies recently added to the CPD Directory are: Anord Control Systems; Oventrop UK Ltd; Exhausto Ltd; EarthEnergy Ltd; Team (Energy Auditing Agency); GEA Grencro Ltd; and Menerga.

For more information on training and development visit the IPD CPD section of the CIBSE website at www.cibse.org

University offers free 'Build Up' courses

CIBSE would like to remind members about the University of Westminster's Build Up programme, which the institute is supporting. Aimed at those built environment professionals currently unemployed or under-employed, it offers a range of free courses that promote and develop inter-professional working and new ways of looking at urban issues.

Running through to the end of September 2010, the programme will give those eligible the opportunity to identify and develop skills in key shortage areas.

You can follow Build Up on Twitter and LinkedIn for the latest programme updates. For more information visit www.build-up.org.uk



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Bright sparks

What can lighting professionals achieve when handed a bit of equipment and a plot of land? **Jill Entwistle** turns the lens on this year's Ready Steady Light

Students often don't get the practical hands-on experience with light fittings that perhaps they should, while lighting practitioners are usually so bogged down in the demands of the latest project that they have little time to indulge in the purely fun side of lighting. The Society of Light and Lighting's Ready Steady Light, started eight years ago, is the antidote to all that, designed to remind everyone of the playful and creative side of lighting. Not that everyone isn't serious about winning.

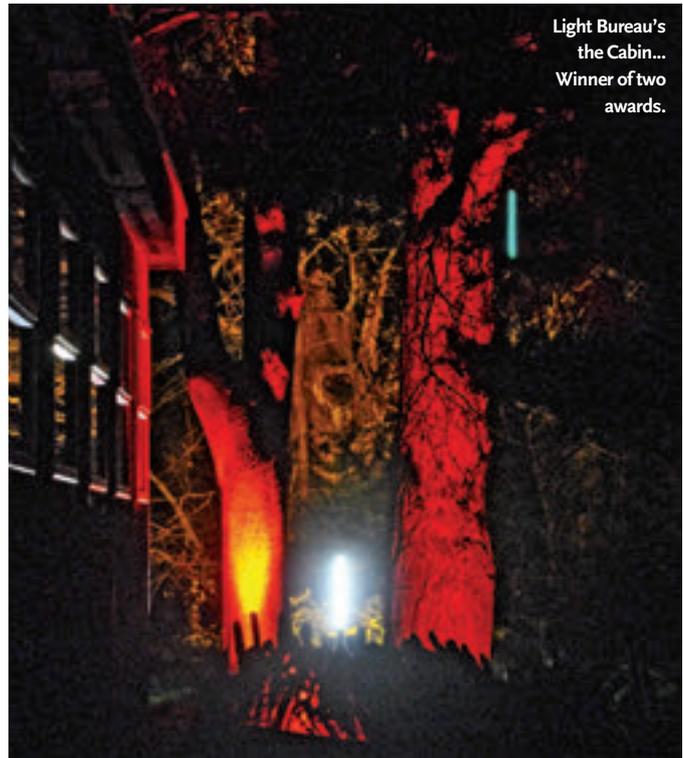
Hosted by Rose Bruford College of Theatre and Performance in Sidcup, Kent, the event in March pitted 14 teams (student and professional) against each other, competing for three awards: technical, artistic and peer. All they were armed with was a maximum of six pieces of lighting equipment, an arbitrarily allotted site in the extensive college grounds and just three hours to come up with a winning lighting scheme.

This year the event was again

dominated by independent lighting consultancy Light Bureau, which for the second year running won two awards, this time artistic and technical, for their scheme for the Cabin site. Playing with perspective and depth of field, the concept used a single upright fluorescent as a mid-distance focal point with an internally-lit pile of logs in the foreground and a large old tree in the background uplit with a 250W floodlight.

'For a second year the team from Light Bureau impressed the judges with the simplicity and visual impact of their scheme,' said Kevin Theobald, who led the artistic judges and represented the International Association of Lighting Designers (IALD) which sponsors this prize.

'The Cabin is a notoriously difficult site to interpret, particularly in the limited time available at Ready Steady Light. Picking just one or two natural elements which were revealed against the sculptural



Light Bureau's the Cabin... Winner of two awards.

impact of the bare fluorescent tube, the composition of the scene was well balanced but had an immediate impact on the viewer.'

While the technical judges in particular were looking at energy use as one of their criteria, SLL president Stephen Lisk said that, such was the scale of illumination needed to create the background effect, use of a higher energy luminaire was fully justified.

Fag Alley (Arup Lighting) was highly commended by the technical judges – Lisk, SLL president-elect Alan Tulla, CIBSE president-elect Rob Manning and SLL Newsletter editor Jill Entwistle – while the Barn (Urbis Lighting) was commended.

The artistic award judges, who included Durham Marengi, Declan Randall and Adam Carree from the theatre lighting profession, highly commended the Old Stables (Rose

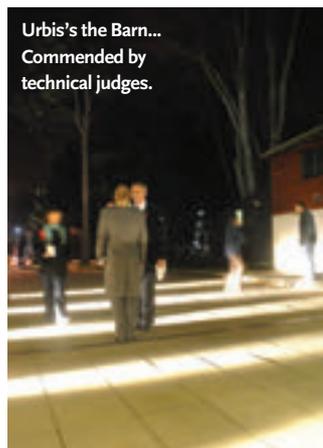
Bruford College) and commended the Old Courtyard (Zumtobel).

The Old Stables was also a contender for the peer prize, awarded by fellow competitors, as was the New Courtyard (Holophane Europe), but the award went to the Urbis Lighting team for its interactive scheme at the Barn.

Rose Bruford has increasingly supported the event over the years, having adopted Ready Steady Light as part of its own lighting design course.

CIBSE president Mike Simpson, who has always organised the event, was helped this year by the college's Peter McGregor Milloy and Rhian Kennedy, who led a team of students coordinating the entire event on the day.

The sponsors this year were Holophane, iGuzzini, Philips, Sill, Thorn, Urbis and Zumtobel. ●



Urbis's the Barn... Commended by technical judges.



Arup's Fag Alley... Highly commended.

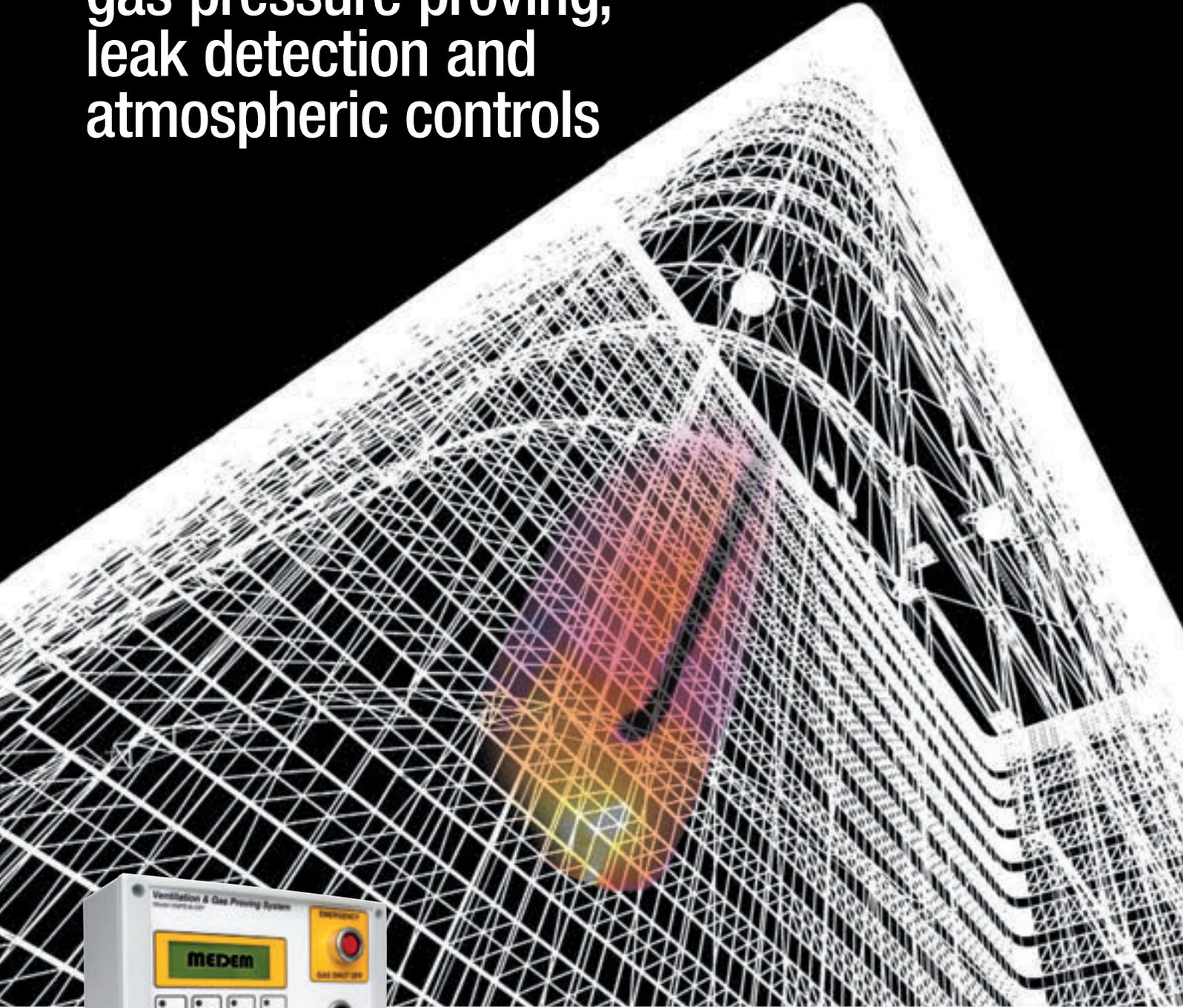
Participating teams

Arup; Bartlett; DW Windsor; Havells Sylvania; Hilson Moran; Holophane; iGuzzini; Light Bureau; Light IQ; Philips; Rose Bruford; Urbis; YLP; Zumtobel

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The colour of their money

How green are the policy pledges of the three main political parties in the UK when it comes to the built environment? **Bob Cervi** offers a guide on what to expect from the winner(s) of the general election

Carbon targets

There is little to choose between the three main parties when it comes to overall carbon targets. Whilst Labour and the Conservatives support the targets set out in the Climate Change Act of a 34 per cent cut in greenhouse gas emissions by 2020 and an 80 per cent cut by 2050, the Liberal Democrats have gone further and proposed targets of 40 per cent by 2020 and 100 per cent by 2050.

Labour says it would aim to create 400,000 new 'green' jobs by 2015, but doesn't specify in its manifesto how this could be achieved. The Lib Dems pledge to allocate £400m for refurbishing shipyards to make them capable of manufacturing offshore wind turbines.

The Tories say they would

encourage private-sector investment to put Britain at the forefront of the green technology revolution. They would also reform the Climate Change Levy to provide a floor price for carbon, delivering the right climate for investment in low carbon energy production and longer-term certainty to investors.

Green homes

Labour and the Conservatives have some similar approaches when it comes to persuading householders to become more energy efficient. The buzz word here is 'pay as you save'. The Tories propose giving homeowners up to £6,500 to pay for energy improvement measures. This sum would be recouped out of savings made on fuel bills over

25 years. Labour is committed to having all household lofts and cavity walls in Britain insulated by 2015 'where practical', according to the manifesto. Its Warm Home Standard for social housing, already announced, would bring in regulation of landlords so that privately rented accommodation is properly insulated.

Labour appears to retain its commitment to achieving 'zero carbon' homes (and non-domestic buildings), and to implementing key changes to the Building Regulations, in particular Parts L, F and G. The Tories also seem to want to continue with the goal of achieving zero carbon buildings, but we await details of how and when they would achieve this.

The Lib Dems pledge a 10-year programme of home insulation that would offer up to £10,000 per property. Savings from fuel bills would, again, pay for this scheme. The manifesto makes a commitment to spending £400m in the coming year on 'insulating public buildings'.

None of the other two parties' manifestos spell out spending plans in such detail.

The Lib Dems also propose an 'Eco Cash-Back' scheme worth £335m in the same period that would fund home improvements such as installation of double-glazing, a new boiler and micro-generation, to the tune of £400 per household.

Both the Tories and the Lib Dems would scrap the home information packs (Hips) introduced by Labour, but would retain the requirement for energy performance certificates (EPCs) to be produced for properties that are sold.

Public sector

When it comes to social housing, the Lib Dems say they would bring 250,000 empty homes back into use. Grants would be available for renovations aimed at providing social housing, plus loans for private use. Local authorities would be allowed to keep 100 per cent of the capital receipts from the sale of council homes.

Labour is committed to building 200,000 new houses a year until 2016, then 240,000 a year until 2020. Councils would have a greater role in building affordable housing, via new local authority housing companies.

In addition, its manifesto makes a pledge to extend the minimum design standards that have been introduced for schools to all new government-funded building programmes. The aim is to 'promote excellence in architecture and [building] design'.

The Tories want to scrap house-building targets but incentivise building by matching pound for pound the council tax receipts that local authorities receive from new homes to encourage 'sensitive' local development. They would also create local housing trusts to develop homes where there

“ Labour wants to re-prioritise funds away from new buildings to frontline services ”

is strong community backing. Longer-term social housing tenants would be given a 10 per cent equity stake in their homes.

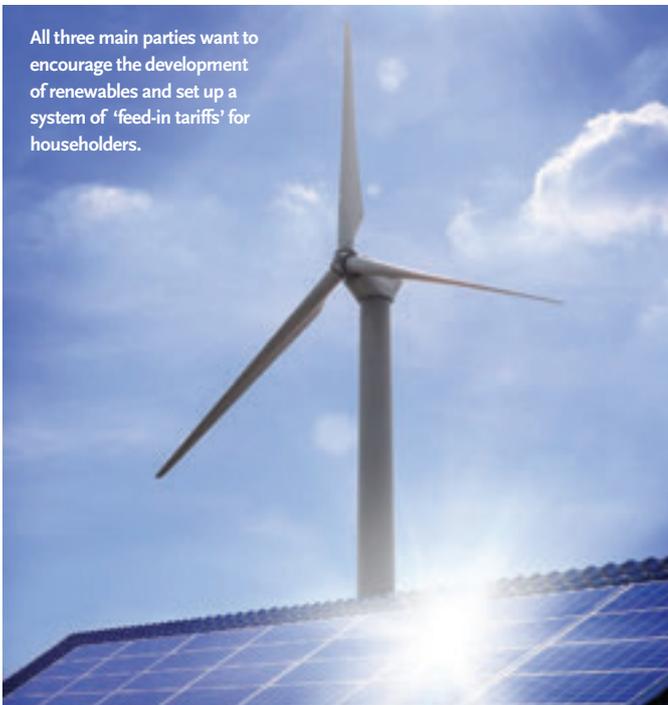
The Lib Dems say they would set aside money to loan to schools to improve the energy efficiency of their buildings. This cash – not specified in the manifesto – would be repaid from energy savings. This, says the manifesto without elaboration, would create 'a rolling fund to help insulate every public building'.

Labour says it plans to re-prioritise spending on health away from new buildings and onto frontline services.

Commercial sector

The Lib Dems say they would improve energy efficiency in the commercial and public sectors by strengthening the Carbon

All three main parties want to encourage the development of renewables and set up a system of 'feed-in tariffs' for householders.



Labour wants minimum design standards for all new government funded buildings.



Reduction Energy Efficiency Scheme (CRC) introduced by Labour. This would be done by requiring companies and government departments to report on their energy use and set targets for reducing it.

Energy generation

The Lib Dems say that, under the proposed 'Eco Cash-Back' scheme, excess energy produced from micro-generation – which presumably refers to items such as wind turbines and solar panels – would be able to be sold to the national grid. Both Labour and Tories also have a commitment to introduce 'feed-in tariffs' in a similar way.

All three parties also have targets for the roll-out of smart meters for properties. Labour wants them in all homes by 2020. They promote the idea of dynamic 'smart grids' that can match electricity supply with demand to increase efficiency and cut waste, as well as promoting the use of

renewables. The Lib Dems support the development of a European electricity 'supergrid' that would operate in the same way.

When it comes to nuclear energy, the Lib Dems diverge from the other two parties in opposing the development of new power stations. 'Based on the evidence, nuclear is a far more expensive way of reducing carbon emissions than promoting energy conservation and renewable energy,' their manifesto asserts. Labour says it is 'planning for' about 40 per cent of electricity generation to come from low-carbon sources by 2020, including nuclear. Fifteen per cent would be from renewables.

The Tories are committed to new nuclear power stations – so long as they receive no public subsidy – and to creating four plants for carbon capture and storage. They would give local authorities the power to establish new district heating networks using low-carbon fuels.

Planning

The Tories say they would aim to speed up local planning decisions, limit appeals against these and abolish the power of planning inspectors to rewrite local plans. Labour, in government, has already published its plans to 'integrate' the planning process with its plans for zero carbon homes and encouraging the use of renewables. The Lib Dems would abolish the Infrastructure Planning Commission, focusing instead on local decision-making.

Bureaucracy and finance

The Tories' former call for a 'bonfire of the quangos' would mean, in practice, that such bodies that do not perform a technical, politically-impartial or independent research function would be scrapped, according to the manifesto. All three parties are committed to setting up a 'green' investment bank aimed at directing private sector funds towards low-carbon initiatives.

Training and apprentices

The Tories plan to create 20,000 extra young apprenticeships and allow schools to offer workplace training. It would also set up 'service academies' to offer pre-employment training for unemployed people.

Labour would offer up to 70,000 advanced apprenticeships a year and 'skills accounts' for workers to upgrade their skills. The Lib Dems would offer up to 800,000 places for unemployed young people, who would be paid £55 a week for up to three months.

Green party proposals

As you'd expect, the Greens' manifesto has a heavy emphasis on energy efficiency. The Greens

Industry reaction

Paul King, UK Green Building Council:

'[The Tories'] commitment to a green infrastructure bank sends an important signal, though it should focus on funding energy efficiency and low-carbon infrastructure as much as new technology start-ups.'

Tom Foulkes, Institution of Civil Engineers:

'The UK will need to invest £40bn to £50bn per annum in infrastructure, so a starting fund [in Labour's proposed green investment bank] of just £2bn falls well short of what will be required.'

Liz Peace, British Property Federation:

'It is one thing [Labour] pledging 50,000 new affordable homes when elsewhere the manifesto says it will "make savings in regeneration funding".'

want all domestic and public sector buildings to be insulated to a high standard. They also want high environmental standards for all new buildings.

The Greens say they would provide incentives for combined heat and power schemes and for district heating, and would support the growth of renewable energy generation. Support would be provided for companies creating jobs in this sector.

They would also oppose new nuclear power stations, and they want all existing ones to be decommissioned. ●



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Call to industry: time to target non-compliance

**non
compliance
costs**

As rates of compliance with the requirement for air conditioning inspections hover at just 5 per cent, CIBSE believes we need to take action. Non-compliance has real costs – it costs the environment, it will cost the UK any chance of meeting the emissions targets, and it costs non-complying companies, which are missing out on a real opportunity to increase their profits.

The CIBSE non-compliance costs campaign, backed by *CIBSE Journal*, is an answer to the frustration building up in the industry and a focused call to government to resolve this situation.

This campaign will address the issues of non-compliance with air conditioning inspection requirements and with F-gas legislation head on, and will gather views and support from across the industry.



The compliance charter

1 The UK government must acknowledge that air conditioning inspection compliance is not working and must move the responsibility for enforcement away from Trading Standards to a body which is more interested and able to act.

2 The government must set targets for air conditioning and F-gas compliance that the enforcing body agrees are achievable and sign will up to.

3 The government must improve communication with UK companies informing them of their obligations to comply with air conditioning inspection and F-gas legislation.



Why comply?

The costs of non-compliance impact upon:

Businesses that have invested in skills to deliver the statutory inspection regime, but are not seeing uptake on that investment.

Building owners and operators, who are missing tangible cost savings arising from compliance.

Government, which has implemented the relevant EU Directives, but cannot demonstrate genuine implementation and compliance .

The Climate Change Committee, which will be concerned that targets for cutting emissions via these regulatory measures are clearly not being achieved, jeopardising the UK carbon budget.

Why it matters

CIBSE currently estimates that less than five per cent of the air conditioning systems qualifying for inspection have had them undertaken.

The current enforcement of air conditioning inspections is clearly not adequate. It is difficult for trading standards officers to keep on top of their duty to enforce inspections. As a result, building owners and managers may not be aware of, or benefit from, potential savings that an aircon inspection report would otherwise have highlighted.

An air conditioning report (ACR) is produced as a result of the inspection, with recommendations on how the systems could be run more efficiently, but there is currently no mandatory requirement for the lodgement of the report with the register of energy performance certificates (EPCs) – and therefore no way to monitor that the inspections were completed, the reports were given to the relevant persons or that any carbon was saved as a result of the reports.

With the mandatory lodgement, however, all records of ACRs would be stored on a centralised system, similar to the method used for both EPCs and display energy certificates.



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non compliance costs

How you can be involved

Sign up to the campaign now at:
www.cibse.org/noncompliancecosts

The campaign will offer participants the opportunity to:

- Download the campaign logo to display on your website
- Download a letter to send to prospective candidates and subsequently to MPs
- Download a letter to send to your local paper
- Join the campaign online, signalling your support for our compliance charter
- Download the business case for air conditioning inspections which, from mid-May onwards, can be used to go to your MP and request a meeting or a parliamentary question

How compliance can

Tower of London

A historical landmark requiring a number of AHUs for various buildings and areas within the site

The main requirement for air conditioning was on the ground, first floor and basement archive stores. All plant was estimated to have been installed during the past three decades, and for the first 15 to 20 years the plant underwent refurbishment once. Planned preventative maintenance (PPM) was introduced by the facilities management team, which realised that further improvements could also be achieved.

Following an air conditioning inspection, the report identified a series of low-cost measures that enabled more energy efficient running of the plant. Lagging of ductwork/pipework, replacement of door catches, and

“ The inspection report enabled the FM team to take prompt action on recommendations made ”

the cleaning and/or replacement of filters and blocked coils were the main issues reported by the inspector.

Though simple to change or resolve, these measures would probably have averted more serious problems, such as the burn out of pumps and motors caused by blocked coils and filters not picked up by the PPM or other means. The measures were estimated to produce 22 per cent energy savings, or 37 per cent savings in running costs, and a reduction of about 236 tonnes of CO₂ annually, with payback under a year.

By having the aircon inspection report, the FM team was able to take prompt action on the recommendations gain advantage from the benefits available

The full case study can be found in CIBSE Journal, October 2009, starting on page 40



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save you money



Simon Weir

Eland House

Office building housing the UK Department for Communities and Local Government

Eland House has two chillers, 11 air-handling units, a building management system, two direct expansion units and a number of terminal units such as chilled beams. The building has only been in use since 1998. The inefficiencies of the building were highlighted by the difference in the energy performance certificate (EPC) and display energy certificate (DEC) ratings.

The EPC demonstrated a good modern building was given a reasonable C rating, whereas the DEC showed that there were issues with high energy usage in the building and rated the building at F. To demonstrate and test the use of air conditioning inspections, the Department for Communities and Local Government invited inspectors to look at their air conditioning systems and plant to find out how they could reduce the energy use and improve on the DEC rating.

The recommendations ranged from high capital cost changes to the plant, to utilising the cost-effective 'quick wins', focusing mainly on controls issues and the correct operation of equipment. The total energy savings for these measures was just under 550,000kWh, or a 9.9 per cent reduction of the building energy load. This equated to 238 tonnes of CO₂ and a cost saving of £32,642 per annum. The implementation costs of these measures were £8,200, which gave a payback of three months with the equivalent cost of £34/tCO₂ saved.

The result was an improvement of the DEC rating to an E, but it was proposed that further higher capital cost measures, such as sub-metering equipment, data reading equipment for chillers and some plant upgrades, could improve the rating further.

The full case study can be found in CIBSE Journal, February 2010, starting on page 30

■ The result was an improvement in the DEC rating and proposals for a range of other measures ■



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Letters

We need not be the dying breed

Climbing out of recession, we should take note of the hidden losses in manpower and ability. Many of the engineers lost from employment may not return to building services, preferring a more secure position rather than suffer the vagaries of the construction industry.

Where are the new candidates going to come from? In the last year, I have noted several opinions and letters in the *Journal* which bemoan the lack of suitable graduates or other candidates coming into the industry. My particular engineering degree course at the University of Strathclyde disappeared years ago, as have courses at Liverpool, Bath and many other institutions, due to lack of applications from undergraduates. Where would we be without the stalwart universities that have survived, and the new universities who appreciate our discipline?

But I place the core problem earlier in the education process, at school stage, where mathematics and physics are dying subjects. In my view, you can't be an engineer without an understanding of both these subjects, which makes this a major problem for our industry.

There is also the problem of some of our professionals moving over to low carbon and energy work. These are many of the aspiring engineers that we need in building services, but we are losing their analytical abilities to a peripheral aspect of our services.

CIBSE is going down a path, in my view, where a more accurate description of the letters should be the Chartered Institution of Buildings, Sustainability and Energy. If we lose the 'building services', we will fail as a sector in construction and as a learned society. Now is the time to ensure our prosperity through education and through an industry which young people see as inspiring. Do building services engineers really need to be a dying breed?

Ken McDougall

The true basics of heating flow rates

Your article on commercial heating, 'Back to basics' (February, page 50), could be misleading. It states that usage of heat generators such as condensing boilers or heat pumps reduces flow rates. The fact is that although the temperature differential between flow and return will be

greater in many systems, this is not the case in all of them.

The article quoted heat pumps with flow and return temperatures of 50/45C, in which the flow rate would increase unless improvements of the building envelope reduced the heat losses by more than 50 per cent. It should also be noted that the heat that can be dissipated from the existing emitters, for example radiators, will be decreased due to reduction of the heat



Is the recession driving engineers from building services, asks Ken McDougall, left. See also our jobs survey article, page 46.

source temperature settings. The emitters are not as much sized for the delta T between flow and return, but for the delta T between average emitter temperature (which is effectively average of flow and return temperature) and the room temperature.

For example, take an existing building with a 82/71C heating system and analyse a sample radiator – Stelrad Elite K1 600mm high and 1,000mm long. Based on the manufacturer information, the heat output would be 1,000W at 75/65/20C; and to get actual output, a conversion factor needs to be used for temperature difference between average flow/return temperature and the assumed temperature within the heated space.

For 82/71C system the temperature differential would be around 55C (it is actually 56.5C), which gives a conversion factor of 1.132 and actual radiator output of 1132W. After

the heat source is changed to, for example, a condensing boiler (55/35C), the temperature differential required for conversion will be reduced to 25C and the conversion factor of 0.406 needs to be used. This will result in the same radiator having output of 406W, which is around 64 per cent of reduction of the original capacity. Therefore, even with the improvements in building envelope – reducing the heat losses and infiltration – together with original oversizing of heat emitters, this might not have been as high as 64 per cent.

It is also stated in the article that low flow rates mean less heat needs to be generated. The fact is that the amount of heat that requires to be generated does not depend on the flow rate but on the building heat demand together with system losses – these are the basics.

Readers should also refer to CPD article in the same edition (February, page 63), which discusses the design of air source heat pumps for heating and which confirm the above facts.

Michal Koscielniak, mechanical engineer, SVM Glasgow

Use the green solutions

The government's target of 3m greener, more affordable new homes by 2020 is commendable but there are millions of people who need a solution now. As an industry, we already have comprehensive technical solutions to eradicate the situation where people have to choose between heating, eating and paying rent. It's critical that we continue to promote next-generation cost-effective and energy efficient products to those in public – and private – housing, who can specify for change and a change for the better.

Neil Evans, general manager, Thermo-Floor

CIBSE Journal welcomes article proposals from any reader, wherever you are – whether it be letters, longer opinion pieces, news stories, people or events listings, humorous items, or any ideas for possible articles.

Please send all letters and any other items for possible publication to: bcervi@cibsejournal.com, or write to Bob Cervi, Editor, *CIBSE Journal*, Cambridge Publishers Ltd, 275 Newmarket Road, Cambridge, CB5 8JE, UK. We reserve the right to edit all letters. Please indicate how you wish your letter to be attributed, and whether you wish to have your contact details included.



The future of commercial heating is changing dramatically. Rising fuel costs and the need to reduce carbon emissions are driving the demand for renewable technology.

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Talkin' about my generation

Hopes for a low carbon future will rest upon the resolve of young engineers, architects and others in the supply chain to work together, argues **Morwenna Wilson**



To deliver the goal of a low carbon economy there are two generations of construction industry professionals that must be fully engaged. The first is the one that is currently responsible for decision-making, detailing the plans for future change and starting the reform. The second is the generation that will, in future decades, have to see the reforms through and maintain the momentum. Only if we can lay the right foundations will this second generation, my generation, be able to achieve our goals.

That is why the UK Innovation & Growth Team (IGT), a cross-industry body set up by government to assess the state of the construction sector, includes a group dedicated to young professionals charged with exploring the vision for the industry from 2020 to 2050. On behalf of CIBSE, and as an eligible member of the second generation, I sit on the IGT 2050 Group. This is despite the fact that I am currently planning to draw my government pension in 2048 – although I'm sure that legislative changes will keep me working well beyond 2050!

During the IGT 2050 Group's first meeting with chief construction adviser Paul Morrell, it quickly became clear that one of the biggest stumbling blocks is the existence of more than 300 institutions, groups and networks operating in the construction sector. A key question, and one that has become the basis for one of the 2050 Group's two 'uncertainties' in our scenario planning, is: How can we set and achieve common goals when our industry is so fragmented?

Our second 'uncertainty' relates to the apparent lack of direction from government. Which of the mainstream political parties in Britain, we asked, would ever propose policy and regulations that would guarantee a low carbon economy without risking alienating the majority of the population?

While the population is apathetic about or unaware of the need for climate change reform – or simply unable to afford the measures that would be required to achieve the low carbon economy – the familiar empty ideology and plethora of targets (without coherent plans of how we should reach them) will predominate. Four-year political voting cycles are not ideal for setting long-term, planet-changing goals.

Don't get me wrong – we were not looking to deflect the blame, but simply to acknowledge that the political parties will only offer what they perceive their potential voters want to hear. Our second uncertainty was, therefore, a well-informed population aware of the challenges and opportunities of the transition to a low carbon economy, versus a protectionist population, denying the need for climate change reform.

Our conclusions were predictably stark: we were unanimous in the view that the most favourable scenario is a joined-up, collaborative industry able to lead transition to a low carbon agenda backed by a supportive population. However, this is not the current reality, and neither government policy nor industry strategies are leading us that way. The general view was that, given the current trends, the construction industry will remain fragmented and follow change rather than lead it.

With the next government in the UK about to be elected for the next four crucial years – assuming there's no constitutional crisis arising from a hung parliament – the ITG 2050 Group will be exploring both uncertainties in more detail in the hope that the second generation will be able to influence and start laying the foundations with the first. In particular, we will be addressing what drivers can help the industry lead the agenda and be more integrated in its responses in the long term.

It will, inevitably, fall to my generation to set the example by creating a culture rooted in collaboration and mutual goal sharing – that is our task and it will require us to demolish many of the professional boundaries established by previous generations of engineers, architects and others. ●

It will fall to us to set the example by creating a culture rooted in collaboration and mutual goal sharing

Morwenna Wilson works for Arup and is a leading member of the CIBSE Young Engineers' Network. This column represents her personal views.

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SUDS rise to the top

Amid general election fever a new piece of legislation has gone largely unnoticed – but it is of particular importance to public health engineers, writes Hywel Davies



June and July 2007 saw unprecedented rainfall across the UK, with major floods in several urban areas. Twelve people died and 48,000 homes and 7,000 businesses were flooded. As a result, the Pitt Commission was set up to investigate the tragedy, and the Flood and Water Management Act 2010 is now the government's response. The act is one of those which, in the final days of the UK parliament, is part of the 'wash-up' of non-controversial legislation that has cross-party support and is speeded through to the statute book.

It aims to provide better, more comprehensive flood-risk management for people, homes and businesses. There are currently 5m people living in flood-risk areas, and the act seeks to ensure that they are better protected. It also tackles bad debt in the water industry, improves affordability of water bills for community groups and individuals, and helps ensure continuity of water supplies to the consumer.

But perhaps of greatest interest to public health engineers is the removal of the automatic right to connect to sewers, intended to encourage uptake of sustainable drainage systems (SUDS) and to provide for unitary and county councils to adopt SUDS for new developments and redevelopments. This is a significant change in the way that surface water disposal is handled.

Current automatic connection rights mean that most new developments rely on conventional means of disposal of surface water, rather than on SUDS. The act aims to encourage closer dialogue between the developer, designer and approval body to minimise the risk and potential impact of flooding from surface water run-off, and it introduces sustainable drainage as a legally defined concept.

The new legislation amends section 106 of the Water Industry Act 1991 by introducing a new section, 106A, which removes the automatic right to connect to a surface water sewer. Only approved systems will have the right to do so, and the water company has limited rights of refusal for such connection.

The act introduces a requirement for sustainable drainage systems to be approved prior to the start of construction by the county, district or borough council,

except for major projects consented under section 38 of the Planning Act 2008. The approving body must consult the water authority, but has no obligation to take their views into account when considering an application. The water company must accept the connection of an approved sustainable drainage system to their sewers.

It also makes provision for the introduction of national standards for the design, construction, maintenance and operation of sustainable drainage systems. Consultation on these standards is promised, so the role of current CIRIA Guidance is not yet known (see sidebar).

One other element of the act has wider relevance. At present, water companies can only restrict water usage by the implementation of hose pipe bans and the use of drought orders to manage their water supplies. The legislation introduces wider powers for water companies to restrict non-essential water usage such as pressure washing of patios and filling of swimming pools. But there is also provision for customers to be compensated for the period when their supply is restricted. The intention is to encourage water companies to take steps earlier to reduce the severity of a drought.

Introducing a clear statutory basis for approval and implementation of SUDS is a key development for public health engineering. Such systems can now be incorporated into designs with greater certainty and knowledge that there is a clear basis for their approval and adoption, reducing risk to the client and promoting new approaches to surface water management and flood prevention. SUDS are no longer speculative, innovative or unusual – they are now mainstream water engineering. ●

For more information, visit www.defra.gov.uk/environment/flooding/policy/fwmb

The act can be found on the website of the Office of Public Service Information: www.opsi.gov.uk/acts/acts2010/pdf/ukpga_20100029_en.pdf

Hywel Davies is technical director of CIBSE.

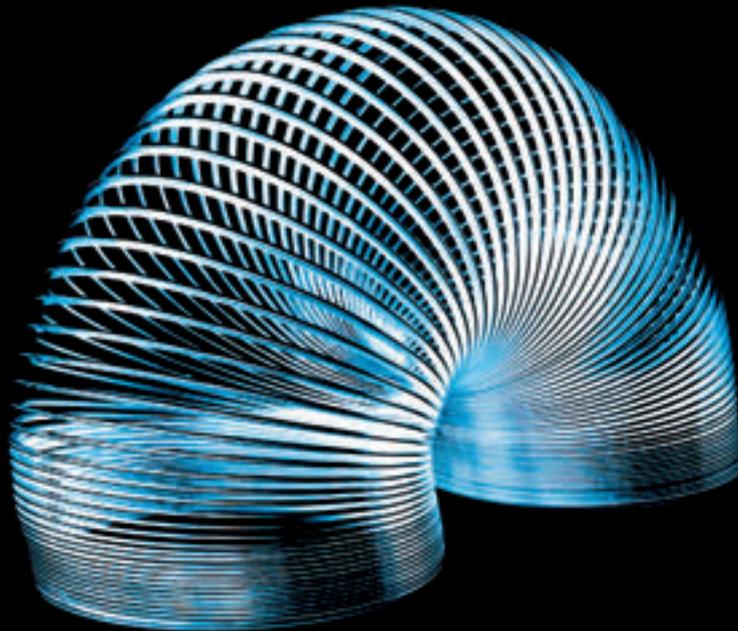
Sustainable drainage systems, or SUDs, are now mainstream water engineering

DEFINITION OF SUDS

'Sustainable drainage' means managing rainwater (including snow and other precipitation) with the aim of: reducing damage from flooding; improving water quality; protecting and improving the environment; protecting health and safety; and ensuring the stability and durability of drainage systems.

The SUDS manual, CIRIA Publication C697, provides best practice guidance on planning, design, construction, operation and maintenance of sustainable drainage systems to facilitate effective implementation within developments.

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LEED contender?

Why is the long-established UK green building rating system, BREEAM, being nudged out of the global limelight by its smaller, younger US rival, LEED?
Carina Bailey investigates

Considering its high profile, you could be forgiven for thinking that LEED is the definitive global leader among the existing environmental standards for buildings. The Leadership in Energy and Environment Design certification was launched by the US Green Building Council as a pilot programme in 1998, and was based on the UK's BREEAM (BRE Environmental Assessment Method).

BREEAM, created 10 years earlier, now has around 116,000 buildings certified worldwide, against LEED's 1,350. Indeed, LEED currently holds a relatively niche position in the UK and European markets, according to some experts. So why all the hype about LEED?

Ivan Rodriguez, technical director at URS Corp, believes much of it is down to the sheer size of its marketing potential: 'In the UK we have about 10,000 people who have been trained for BREEAM. LEED has about 130,000 LEED assessors – so the marketing potential for LEED is huge.'

Rodriguez also believes it is easier to become a LEED accredited professional (AP) compared with BREEAM, particularly as the training doesn't usually have to be squeezed around full-time employment.

Chris Twinn, director of consultants Ove Arup and Partners, says LEED's openness is another factor in its apparently high profile. 'The way information is presented in LEED is a lot more transparent than BRE

and BREEAM. This fosters a lot of spin-off research. Universities examine the data, coming up with trends and looking at some of the cost benefits – which you don't see with BREEAM.'

With LEED, you can find out what credits count for different ratings – information which isn't forthcoming from BREEAM. LEED also appears to be more corporate friendly, with many global companies choosing it over BREEAM.

Globally, BREEAM International accounts for just one per cent of registered projects – and that figure drops to even less for certified ones. According to Rodriguez, BREEAM has about 350 trained assessors for 24 countries, with around 133 buildings currently registered. But BREEAM appears to have even less clout in the Middle East.

A decree by United Arab Emirates vice president and Prime Minister of Dubai, Sheikh Mohammed bin Rashid al-Maktoum, has meant that since 2008 all new buildings in Dubai have had to apply the 'highest international standards' of sustainability. Dubai World, one of the government's investment companies, has since conducted the largest research programme in the Middle East for new sustainably certified buildings and found LEED to be the most suitable system, says Chris Nunn, associate director, sustainability, at Faithful+Gould.

Dubai World is now set to launch its own rating system, World Energy and Environmental System for Development, Optimization and Measurement (WESDOM), which is based on LEED. Crucially, its minimum rating will be compulsory for all Dubai World projects, which will also have to be revalidated every year – in contrast to both BREEAM and LEED.

Says Nunn: 'Dubai World hasn't just taken LEED off the shelf, it's adapted the standard. It has set minimum



BDP



standards saying that about 32 of the LEED credits will be mandatory according to the EHS [Environment, Health and Safety] standard – just below the Silver rating – and all EHS buildings are monitored post occupancy to ensure they do operate in a sustainable fashion according to the design, and deliver the benefits that the design promises.

‘So although this has just been an interim response to Sheikh Mohammed bin Rashid al-Maktoum’s decree, it’s very LEED-focused and has done some of the things that LEED and BREEAM failed to do, such as the post-occupancy monitoring.’

Interestingly, Dubai World has publicly said every region should be creating a rating system to suit its own needs.

Nunn adds that despite BREEAM Gulf’s weighting system being specifically tailored to the area and having a high percentage of water-related credits, LEED is capturing more market share and winning more projects, primarily for two reasons: ‘It’s just a cultural thing, but the Middle East is actually served by a lot of Americans so they’re preferring the LEED standard and promoting it.’

‘But, more importantly, LEED has penetrated the regulatory frameworks of Dubai, with Dubai World

mandating the use of LEED in each zone, allowing LEED to capture that market share on the back of regulatory reforms which are proceeding at pace in the United Arab Emirates, as well as winning the backing of key players.

‘BREEAM Gulf remains a voluntary standard in a market that’s rapidly incorporating aspects of LEED into regulations. BREEAM hasn’t been pushed by a regulatory body or by key development authorities, so it’s lost a lot of market share in Dubai.’

But there are downsides to LEED, says Twinn, who argues that it is still too costly compared with BREEAM. Furthermore, LEED is tailored for large projects and geared towards conventional systems. It has also been accused of penalising innovation, although the US Green Building Council has added innovation credits to address this issue, he adds.

LEED has also been criticised for being too complicated and not thorough enough, relying too heavily on the US supply chain and operating a long and complex ‘paper chase’ to get everything signed off centrally, says Twinn.

In comparison, BREEAM is considered to be of a marginally higher standard and can be adapted more easily to different regions and countries, as well as

Left to right: Australia’s Dubai Pearl development achieved a LEED Gold pre-certification; a mixed-use scheme in India that’s aiming for a LEED Platinum; Pricewaterhouse Coopers’ offices are the first in London to achieve BREEAM Outstanding; Brighton and Hove Albion Football Club should achieve a BREEAM Very Good.

“ The way information is presented in LEED is a lot more transparent than BRE and BREEAM ” –

Chris Twinn

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Peel Media



MediaCityUK, shown on the cover, was the first project to be accredited under the new BREEAM Communities scheme.

> having more bespoke options – although these can become costly. Additionally, it has been criticised for being less market friendly and slow to respond to queries, he says.

There are many other assessment methods currently being devised, or already in use, by countries around the world that are very much based on the BREEAM

or LEED systems, but with local variations. This concerns Alfonso Ponce-Alvarez, director of marketing and international affairs at the Centre Scientifique et Technique du Batiment, which helped to set up the Sustainable Buildings Alliance (SBA). Despite this continuing proliferation of green rating systems, the SBA, a body which aims to develop common metrics in green construction, says there needs to be a global standard because of the lack of co-ordination by scheme operators. ‘This situation is profoundly unhelpful for those businesses wanting to reach a global standard,’ Ponce-Alvarez insists.

But Angus McIntosh, head of research at property consultancy King Sturge, argues that analyses of which rating system is best can be short-sighted when it comes to the long-term goal of creating sustainable towns and cities. In his view a project can only be sustainable if all social, economic and environmental aspects are met. ‘I liken this to running four times around a running track and when you get to the white line, the white tape, you will be there,’ he says. ‘We’re somewhere on the crown of the first bend of understanding this whole issue. What is a sustainable city? What is a sustainable building? How are we going to measure it, how are we going to incentivise it? How are we going to tax people on it? We’re only just beginning to learn.’ ●

BREEAM vs LEED

BREEAM

The BRE Environmental Assessment Method was created by BRE, a UK building research organisation funded mainly by the government. It has about 15 different schemes that assess the performance of buildings across nine categories:

- **Management:** overall management policy, commissioning site management and procedural issues;
- **Energy use:** operational energy and carbon dioxide (CO₂) issues;
- **Health and well-being:** indoor and external issues affecting health and well-being;
- **Pollution:** air and water pollution issues;
- **Transport:** transport-related CO₂ and location-related factors;
- **Land use:** greenfield and brownfield sites;
- **Ecology:** ecological value conservation and enhancement of the site;
- **Materials:** environmental implication of building materials, including life-cycle impacts; and
- **Water:** consumption and water efficiency.

LEED

The first pilot system for LEED (Leadership in Energy and Environment Design) was launched in the US in 1998, largely inspired by and based on BREEAM. LEED was created to: define ‘green building’ by establishing a common standard of measurement; promote integrated, whole-building design practices;

recognise environmental leadership in the building industry; stimulate green competition; raise consumer awareness of green building benefits; and transform the building market.

LEED awards credits on a project’s performance in the following nine areas:

- **Sustainable sites:** site selection and management during construction;
- **Water efficiency:** encourages smarter use of water;
- **Energy and atmosphere:** encourages a wide variety of energy strategies;
- **Materials and resources:** the selection of sustainably grown, harvested, produced and transported products and materials;
- **Indoor environmental quality:** promotes strategies that improve indoor air as well as providing access to natural daylight and views and improving acoustics;
- **Locations and linkages:** encourage homes being built away from environmentally-sensitive places;
- **Awareness and education:** encourages homeowners to be educated in how to operate their energy-efficient homes.
- **Innovation in design:** provides bonus points for projects that use new and innovative technologies and strategies; and
- **Regional priority:** localised credits for six US regions.

Sources: www.usgbc.org/leed, www.breeam.org

“ This situation is profoundly unhelpful for those businesses wanting to reach a global standard ” – Alfonso Ponce-Alvarez

Facing up to biomass emissions

Hoval's new CF ceramic filter for removing particulate emissions from biomass boilers received considerable interest at the CIBSE conference. Here, Kevin Stones, Engineering and Service Director with Hoval, considers the implications of new air quality legislation and describes why a new approach to filtration is required.

The recent growth in the use of biomass boilers means that particulate emissions from biomass are beginning to come under closer scrutiny. And while biomass still accounts for a tiny proportion of the UK's particulate emissions, this contribution clearly has the potential to increase with the growing use of biomass.

In parallel with these developments, EC Directive 2008/50/EC, Ambient Air Quality and Cleaner Air for Europe, creates a requirement for tighter control of the smaller particles that are not filtered by traditional mechanisms such as multi-cyclones. Consequently, we will soon be faced with a need for more efficient, retrofitable filtration of particulate emissions from biomass boilers. Hoval's new CF ceramic filter, capable of removing up to 96% of particles of 10 and 2.5 microns in diameter, is discussed in more detail below.

Firstly, it's worth reviewing the background to this situation. Directive 2008/50/EC came into force on 11 June 2008 and must be transposed into national legislation no later than June 2010. Of particular significance in these regulations is the size of particles that will be controlled. In the past, emphasis has been on particles with a diameter of 10 microns or above (PM_{10}). However, the new Directive will seek to introduce a new control framework for particles down to 2.5 microns in diameter ($PM_{2.5}$).

Size matters

Biomass boilers make a small contribution to particulate emissions, compared to traffic, and the level of emissions will vary with the quality of the fuel and combustion efficiency of the boiler. So using boilers that comply with EN 303-5 Class 3, in conjunction with high quality fuel, is the first step in minimising particulate emissions.

Of course, many biomass installations already use a cyclone or multi-cyclone to remove particles from flue gases.

However, cyclones are totally dependent on the mass of the particles for removal, so while they will remove around 50% of the coarser particles they do not remove particles below PM_{10} . This is why the new Directive and its emphasis on $PM_{2.5}$ has such significance for biomass installations.

One alternative to cyclones and multi-cyclones is electrostatic precipitation, whereby particles are charged and removed from the flue gases in an electrostatic field to a collector. This is very effective for smaller particles but electrostatic filters tend to be both very expensive and very large – often too large for typical UK plant rooms.

Until recently there has not been a financially viable alternative but Hoval has now optimised a ceramic filter for use in biomass installations – without making the overall cost of a biomass installation prohibitive.

Capable of removing up to 96% of $PM_{2.5}$ and PM_{10} particles, ceramic filters can be used with any type of biomass boiler and can be retrofitted to existing installations, so they have the potential to address many of concerns (real or perceived) about particulate emissions from biomass.

Ceramic filters are connected to the back of the boiler, in the same way as a cyclone. Each unit contains a matrix of porous ceramic tubes which are closed at the lower end. The number of tubes in each matrix is aligned with flue gas volumes for each boiler.



As flue gases are drawn through the filter by an inline fan, the gases are able to pass through the walls of the ceramic tubes, while particles are trapped. At regular intervals (timed and/or in response to a pressure drop across the filter) a pulse of air is used to dislodge the particles, which fall into a collection bin.

Moving forward

There are already strong indications that the Directive will be largely enforced through local authority planning permission and Defra has stated that "local authorities are delivery partners in relation to air quality management".

Indeed, some local authorities have already expressed concern about biomass in urban areas, so there is a very real concern that failing to find a suitable solution could severely curtail the potential for biomass in the UK. This, in turn, would have a significant impact on our ability to meeting the country's commitments to reducing carbon emissions. Hoval CF filters have the potential to meet the challenge of particulate emissions and ensure that biomass remains as a viable element in the UK's renewable heating strategy without compromising on air quality.

For further information please call 01636 672711 or visit www.hoval.co.uk

CF Model	Depth	Height	Width
50	990mm	1510mm	1120mm
500	2260mm	1925mm	2080mm
Twin 1000	2915mm	1926mm	3520mm



Hoval

Rob Manning... The CIBSE president's key message is: collaboration, collaboration, collaboration.

Delivery man

'Active' engineering needs to be at the heart of green construction, says CIBSE's new president, who tells **Bob Cervi** about his hopes for the coming 12 months – and the next four decades

Rob Manning looks remarkably unruffled, bearing in mind that he has not one but two new 'jobs' to contend with. As well as taking on the mantle of CIBSE president this month, Manning is also getting to grips with a new post at AECOM consulting engineers, where he moves from being chief engineer for building services to heading up the healthcare sector.

So does this mean doing less frontline technical work? No, says Manning, as he'll be very much involved in the nitty-gritty of healthcare projects across the UK. Which is perhaps business as usual for a man whose 40 years in the industry has very much been focused on the delivery of services.

'My whole career has been about delivering buildings,' he says. 'It's why I am what I am.' That should certainly stand him in good stead, bearing in mind that, as he puts it, 'many of CIBSE's members actually spend time delivering buildings'.

Of course, agrees Manning, the underlying problem is that what architects, designers and engineers intend for their projects is too often not what is delivered after occupancy. And this is very much down to the difficulty that the professions across the supply chain are having in working towards a common goal.



Simon Weir www.simonweir.com

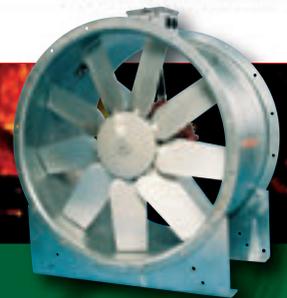
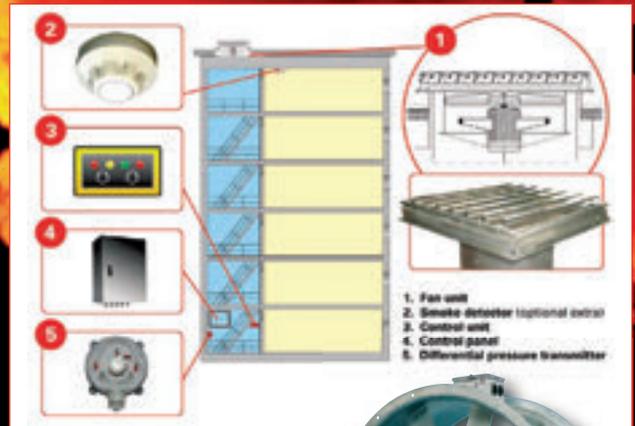
'When I came into the industry in 1970 I wanted to do holistic design, but I was stunned at the fragmentation of the industry,' Manning recalls. 'Forty years on, it's still like that.'

Confronting this lack of professional cohesion is at the heart of Manning's vision for both the future of the industry and CIBSE's role as a membership body. The widening gulf between the conceptualisation of sustainable buildings and the nuts-and-bolts services that are meant to deliver them needs to be closed, he insists. And CIBSE and its members are in a prime position to help reduce this gap.

'We can't deliver low carbon buildings unless we have everyone in the supply chain involved in this goal,' Manning explains. He believes that contractors in particular need to be recognised as deliverers of low carbon solutions, and that, more widely, the industry's >

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Working in partnership





Rob Manning

CV

Education: Born 1950. Attends South Bank Polytechnic as an undergraduate.

Career: 1972 – As part of university work experience, joins Oscar Faber and becomes full time, involved broadly in design and construction processes. 1982 – Moves to a contracting company in Zimbabwe, then later to Botswana. 1987 – Works for building services consultancies in the UK. 2003 – Rejoins Faber (now AECOM) and works on healthcare projects. Becomes chief engineer. 2010 – Head of healthcare sector.

Personal: Married with two grown-up daughters and a son who is working as a civil engineer in Libya. Lives in the Cotwolds and is an avid hill walker. Other interests include golf and wildlife.

> environmental objectives need to be incentivised as much as cost, time and build quality.

‘Over the last 15 years, the procurement process has become contractor-led,’ Manning says. ‘Once upon a time we used to be appointed as designers by the client. We would produce a design with the structural engineer, the architect, the quantity surveyor. We would go to tender and appoint a contractor.

‘We would then act on behalf of the client – the end-user of the process – to monitor the performance of controls, of commissioning, and so on – in other words, make sure what was specified was actually delivered.

‘Both consulting engineers and architects have handed on to contractors and specialist providers the job of providing the services. Now what happens is that the contractor leads the procurement process – the client goes direct to the contractor. Indeed, Private Finance Initiative schemes are a good example of contractor-led procurement.’

The upshot, says Manning, is that: ‘In a lot of procurement processes the designer has become divorced from delivery. This means that the designer, while still able to learn what went wrong, is not involved enough in the project to know why these things went wrong. When designers are isolated in this way, there isn’t a feedback loop for them to learn the lessons of what they have done.

‘As a result, there’s also a tendency for the front-end concept designers to put forward ideas that can’t in the end be translated into reality.’

‘Passive’ engineering is essential to the delivery of green buildings, and the industry now needs to bring the ‘active’ engineering aspects of the process – the specification, installation and testing of the actual equipment – back to prominence in the procurement

chain, says Manning. ‘Every day CIBSE members do green engineering – when we select or install the systems, equipment, controls, fans, and so on. As colleagues we have to get together with the other institutions – the architects, structural engineers, the leaders of industry – to try to find a way to get back to focusing more on and incentivising the environmental objectives.’

Manning concedes that it will be a huge challenge to try to push the industry towards this holy grail of collaboration, particularly when, in a recession, the ‘let’s look after number one’ mentality is uppermost, and contractual litigation has long been the accepted way to resolve differences.

‘I believe we need to change the fundamentals of the procurement process before we can successfully develop collaborative working between members of a project team to deliver low carbon objects,’ Manning asserts. ‘The way our contracts work is a showstopper for green-building delivery.’

However, he adds, there are practical tools now being developed that can, in themselves, foster more joint working between professionals. A hobby horse of Manning’s – he has already written about this in the *Journal*, in January 2010 (‘Model activity’, page 48) – is building information modelling, BIM. This process, he says, provides a model that isn’t just about structures but also encompasses equipment and services.

‘BIM provides an opportunity to manage information through the creation of a 3D drawing model, into which you put all the service information – for example, of a boiler’s operation, maintenance and safety requirements. And you can’t build that model unless everybody collaborates.’

The new CIBSE president concedes he has no easy answer to breaking down the barriers between the

different aspects of the supply chain. He is also a realist when it comes to achieving the UK government's timescale for 'zero carbon' homes in 2016: 'I don't think we'll get there. It will cost more and more to achieve this goal – we suffer the law of diminishing returns. In reality, to get there we'll need to green the energy supply.'

However, he is not dismissive of targets in themselves, such as those set by the Energy Performance of Buildings Directive: 'Without the directive, we would not have been driven to develop Part L 2006 and 2010. We need to set detailed standards we can aspire to, and these have certainly brought huge benefits to building services engineering.'

I ask Manning why he wanted to take on the mantle of CIBSE president – a question that sends him into a bout of soul searching. Eventually he says: 'I wanted to take this same message into CIBSE, as a way of influencing legislation and social change – I believe that the real delivery of low carbon buildings can be achieved through collaboration, and as design engineers we need to be true to the fundamental engineering process that will deliver low carbon.'

But does not CIBSE face a huge task in overturning its image as a consultants' club that is full of greying men in suits, men like himself (he turned 60 in March)? Manning remains unruffled. 'We're the youngest of the institutions,' he points out. 'We recognise the need to be a broader church – in doing

■ **There's a danger that we could have another 40 years without real change ... we must recognise that most of the emissions reduction will come from greening our energy supply** ■

so we're attracting younger people to the industry. The Young Engineers' Network reflects active young membership contributing in a way that suits their life and career aspirations. I'd say CIBSE's image should be very good – we just need to promote it better.'

So, bearing in mind that he feels the industry is as fragmented as it was four decades ago when he started in the profession, what hopes does he have for the next 40 years? Where will we be in 2050? 'There is certainly a danger that we could have another 40 years without real change. Bear in mind that, to reach an 80 per cent cut in emissions by 2050 we'd need to be refurbishing 50 buildings every single hour! So we must recognise that much of the emissions reduction will come from greening our energy supply.'

Manning is the first to admit that his vision for collaborative procurement is going to take a great deal longer to come about than his 12-month tenure as CIBSE president. 'If it's going to take another four decades, fortunately I'm unlikely to be around to have to comment on it.' ●

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Tower 42 in the City of London uses LED lighting in some of its office space.



Into the blue

Improving lighting in the workplace has to be about more than increasing energy efficiency. We also need a 'blue sky' approach that focuses on emulating natural daylight, writes **John Aston**

The drive to reduce carbon emissions from lighting is intensifying, and yet few look beyond the savings gained in numbers to ask: 'How is the reduction achieved?' Not since the late 1970s has there been such a focus on energy management in lighting; nor have there been so many companies offering solutions. But simply cutting the electricity used by your lighting poses real risks of ruining the design, and poor lighting may actually lead to much higher carbon emissions and additional business costs.

Eighty per cent of our sensory input comes through our eyes at work, and although lighting may well be using as much as 40 per cent of an office building's electricity, it represents only a tiny fraction of a business's costs. Using a quick-fix solution that spoils the lighting design might well lead to staff having to work longer hours because their effectiveness and concentration has been damaged. Any change to a lighting design must therefore be based on the idea that the right light is provided in the right place at the right time.

Every time there is an energy crisis, cutting energy costs becomes a priority. Popular quick fixes from the past have included the use of high-efficiency reflectors that suppliers claimed would allow the user to remove one lamp from a twin-lamp fixture. Customers were convinced by a light reading (lux measurement) taken immediately below the fitting without being shown how much light they had lost between the fittings.

At present the lighting world is experiencing an unprecedented technology change: the introduction of solid state lighting, or LEDs (light emitting diodes). The result is a plethora of information being projected

at an unprepared market, without enough investigation into how the quantity or quality of light is altered. Big claims are being made concerning LED replacements for conventional fluorescent lamps.

The present 'state-of-the-art' T5 high-efficiency linear fluorescent luminaires are capable of delivering a system efficacy in excess of 80 lumens per watt (taking into account gear and optical losses). The very best LED solutions are achieving 60-65 lumens per system watt, and matching the colour rendering and consistency of a good fluorescent lamp can reduce this figure further.

An apparently low-cost, 'quick-fix' LED lamp replacement will almost certainly not be delivering such performance, so we must always benchmark against the best conventional lighting as well. The Lighting Industry Federation's Technical Statement 41 is particularly pertinent and covers other matters such as product liability and electromagnetic compatibility.

Of course, the real way to use new technologies like LEDs to genuinely beat the old ones will be to develop new products to deliver the benefits most effectively. Initially, such solutions will be more costly to purchase but they may well have a lower whole-life cost.

In addition, there is the danger that future legislation covering the energy use of lighting might encourage the use of quick fixes by relying too heavily on basic efficiency numbers.

The question of whether lighting design is an art or a science is still debated; after all, the visual appearance of a lighting scheme is highly important. But as the Building Regulations develop, there is the danger that a desire to simplify the policing of such measures will lead to highly prescriptive rules – such as 'you will use >

“ Using a quick-fix solution that spoils the lighting design might well lead to staff having to work longer hours ”



The office space on level 12 of Tower 42 in the City of London is one of the first in the UK to use all solid-state lighting.

> a light that provides a certain number of lumens/Watt' – with no regard to how many are used or how they might best be controlled.

Many might argue that the sheer tolerance and adaptive ability of our eyes will overcome such lighting designs and allow us to use 'energy efficiency' to the detriment and exclusion of 'lighting quality and innovation' – something which should be resisted.

Over the last few years there have been a number of

studies carried out surrounding the use of fluorescent lighting with very high correlated colour temperatures, where the appearance of the lamp is almost blue. The basic premise being pursued is to emulate what happens with daylight, which changes in both intensity and colour from sunrise to sunset, every day.

Studies have already shown that the application of 17,000 degrees-Kelvin fluorescent lighting to office lighting has shown marked improvements

Blue sky Study shows benefits for work performance

Blue sky lighting involves the use of fluorescent lighting with very high correlated colour temperatures, where the appearance of the lamp is almost blue. The idea is to emulate natural daylight, from sunrise to sunset.

A number of studies conducted into blue sky lighting seem to prove it has a number of benefits in the workplace. One such study was conducted at RS Components in London. It involved more than 90 participants and used a cross-over methodology to minimise any effects brought about by the

knowledge that research was being undertaken. In addition, the study took place during the winter months between January and March 2007, to minimise any impact that the longer spring and summer days might have had. The system used involved Savio remote phosphor LED light fittings; LuxSpace Mini; and Light Master Modular.

The results revealed improvements in work performance and alertness. Participants also reported better sleep patterns as well as reductions in eye strain, discomfort, fatigue and blurred vision.



Redshift Photography

in the productivity of the staff affected, as well as improvements to their alertness and comfort. An initial study carried out in 2006 demonstrated that work performance was improved, fatigue was reduced and greater alertness noted.

The use of high correlated colour temperature lighting, dynamically mixing it with warmer lighting to create variation through the working day to stimulate interest, can be further developed. As scientists research learning, they are finding that even the most basic changes (such as lighting) can improve education environments.

According to a recent study by Professor Michael Schulte-Markwort, director of the Clinic for Child and Youth Psychology at the University Hospital in Hamburg-Eppendorf, dynamic lighting systems can improve the reading speed of children by 35 per cent, and reduce reading comprehension errors by 45 per cent.

'The drop of 45 per cent for the group working under dynamic lighting shows that with the right light in the classroom it is possible to increase pupils' attention span and concentration significantly,' said Schulte-Markwort. Such lighting has also been successfully applied in hospitals to the benefit of nurses working the night shift.



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LEDs City's towering example

One 'early adopter' of LED office lighting is Tower 42 – formerly the NatWest Tower – in the City of London (above and left). This iconic landmark has recently completed a major investment and refurbishment of its level 12 office space, which is among the first in the UK to use all solid-state lighting. Although LEDs are not yet as efficient as the best T5 technology, they are, nevertheless, delivering savings against the previous design.

The lighting system is controlled using a digital addressable lighting interface (DALI) protocol so that all luminaires are individually addressable. Multi-sensors are used in the spaces to provide both dimming in relation to daylight levels and occupancy detection with corridor linking. Occupants can also control their own lighting using infrared remote control units.

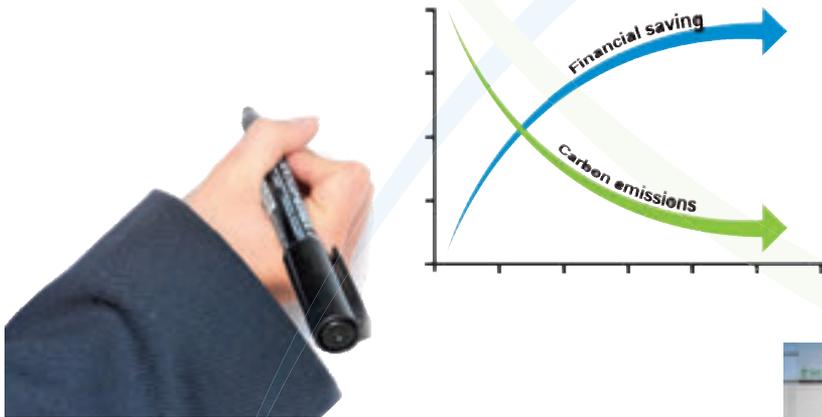
“As the Building Regulations develop there is the danger that energy-saving measures will lead to prescriptive rules”

Clearly this 'blue sky' approach to lighting, with or without the dynamic element, is more effective in its purpose than more conventional solutions. The worry, though, lies in whether such innovation will continue if the only objective being pursued is energy reduction. If we can continue to build our understanding of light in the workplace and so improve the way it is delivered, then perhaps we can work fewer hours with the same levels of productivity, thereby also reducing our demands on other energy-intensive systems such as IT, air conditioning and heating.

And if industry succeeds in making artificial light emulate daylight, then we must design the next generation of buildings to use as much natural light as possible. Artificial lighting will still be needed but a good control system will integrate it with daylight, so that energy use is minimised while still retaining the qualities of both natural and artificial light and the benefits they deliver. Perhaps this answers the old art versus science debate – lighting is a science, but with creative tendencies. ●

John Aston is green marketing manager for Philips Lighting UK

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Generation ISSUE

A future 'generation gap' of engineers is unfolding in the building services sector, which has been pumping out its lifeblood during the recession. **Carina Bailey** reports

The stream of young engineers seeping from the building services sector because of the recession is draining the industry of its lifeblood, many in the profession fear. Anecdotal evidence, and our own jobs survey on p46, suggests that a large number of young and graduate engineers have been made redundant in the past 18 months because of the slowdown – and their skills may be lost for ever.

Even CIBSE's Young Engineers' Network (YEN) London Centre has not remained immune, with four committee members losing their jobs since the crisis began. Eventually, all but one managed to find alternative employment, but it was no mean feat.

Immediate past president Michael Norton says the recession altered the dynamic of the group. 'It really changed the mood on the committee; some were without work, the rest were worried about their jobs. The emphasis moved from being very enthusiastic, optimistic and energetic to a more sombre, downbeat mood, and that did take the wind out of their sails.'

Norton believes, understandably, that it caused the

committee to lose its impetus, with extra committee tasks no longer such a priority.

'In a recession the first people often to be hit are the younger, more junior staff – and they're the ones who find it harder to find new work. I don't think the industry is pulling its weight to support young people and graduates in the recession, which will ultimately lead to those people leaving the industry. And, when things do pick up again, there will be a generation gap as well as a shortage of engineers and junior engineers.'

The knock-on effect that these redundancies could have on universities is something else that bothers Norton, who fears they will see a decline in numbers if there are no jobs available at the end of a course.

One of the reasons the building services sector appealed to Alex MacGregor, project consultant at IES, was because of the number of young people being hired and the opportunities the industry presented.

Of course, the recession is likely to have damaged that perception of the sector. And – although MacGregor has been one of the lucky ones – his role has actually

■ The emphasis moved from being very energetic to a more sombre, downbeat mood ■ – Michael Norton



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Being made redundant has left Robert Hedges with the 'fear'.



Building services appealed to Alex MacGregor because of the opportunities it presented.

"I took a reduction in basic pay and now have to travel almost 100 miles a day to get to work and back" – Robert Hedges

> diversified because of the recession, covering areas such as marketing and software development.

Robert Hedges, mechanical engineer at NPS North East Ltd, was made redundant early last year – something he describes as an 'unpleasant experience'. At the time, Hedges was in a recently-opened satellite office that closed as a result of the economic decline. The M&E design team was disbanded.

'I was one of the lucky ones who managed to secure a position relatively quickly; I took a reduction in basic pay and now have to travel almost 100 miles a day to get to work and back, but at least I'm in employment. I do feel very lucky to be where I am and, although I can say that I feel very secure, the fear of redundancy is always at the back of my mind.'

One of the most common responses from prospective employers turning down job applications, according to Hedges, was a lack of professional working experience – something that is hard to germinate when you're new to the profession. 'My personal concern for the industry is a lack of investment at a junior, trainee and graduate level, as this will almost certainly cause a huge skills void for years to come,' says Hedges. 'For most employers, experience is the most valuable attribute for any potential candidate – however, without companies employing at these levels, how can candidates be expected to gain any experience?'

Jerome Salmon, senior engineer at A&G Partnership, who helped to start the London YEN centre with Norton, was another of the unlucky ones. He describes the time he was made redundant in February 2009 as his 'dark period' in building services. 'It was horrible. I was working at Scott Wilson for about a year when the market suddenly changed, and all the projects I was working on seemed to be shelved.'

Salmon's options were to either move to Manchester or Glasgow – or lose his job. So he opted for redundancy. 'I was hoping that the market wasn't that bad.' But, after sending out numerous CVs, nothing materialised. In the end, Salmon was out of work for about eight months, not able to find another post again

until October last year. 'When you're made redundant, there's nothing in life to motivate you any more and you start questioning your ability as an engineer. Now I'm back on my feet I'm thinking the industry hasn't changed at all – it's all work, work, work! But it makes you work even harder because you know what sort of climate is out there.'

Salmon now feels like he is progressing well, and in his new role he is able to experience new areas, such as public health. 'I think that, although there's a recession, it shouldn't change your aspiration to get where you want.'

However, he accepts that it's probably harder now because companies will likely try to refrain from promoting people because of the financial implications. 'That's the only limitation in the background now,' he adds. 'My ultimate goal, to be part of senior management or to manage my own practice, hasn't gone away – it's just been put on hold.'

But the fear of being made redundant never leaves him: 'Every day I come to work – even though I'm 110 per cent into making the most of what's here – and I'm now trying to squirrel some money away in case the industry is forced back into recession.'

Despite this being an uncertain time, Hedges is confident it is still a very exciting time to be a building services engineer. He concludes: 'Understanding how energy and low carbon technology can be utilised has become essential in modern building design and a crucial factor in the evolution of the building services engineer. I anticipate buildings services engineers whole-heartedly embracing their leading role in the industry and moving to the forefront of the energy revolution.' ●

The closing date for entries to the CIBSE Undergraduate Award 2010, sponsored by Hays, is 31 July. It is open to all those in the final year of their BSc, BEng, MEng or MSc. First prize is £500, runner-up gets £100. To find out more visit www.cibseyoungmembers.co.uk/news/awards

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Pay hits the doldrums

Falling salaries and lack of opportunities are forcing some in the building services professions to consider jumping ship. However, our 2010 jobs survey shows some optimism for the coming year, writes **Bob Cervi**

Salaries in the UK building services professions have been badly hit by the recession in the past year, with many staff experiencing no increase in pay, according to the latest *Hays/CIBSE Journal* recruitment survey of the marketplace. Almost three-quarters of respondents to the survey of professionals across the sector did not receive a salary increase over the past year, while two-thirds thought that salaries were low – up from just over 50 per cent in last year's survey.

The salary downturn could mean that companies will find it difficult to recruit the best staff when the economy improves, experts warn.

'The recession has meant that for many people, salaries have remained static. We expect that this will provoke more movement over the coming year as people look to remedy this,' says Mike McNally, director of recruitment firm Hays Building Services.

'Employers need to address the issue that if they are taking on employees with a lower salary offering, they run the risk of losing talent in the event of an upturn as a result of a lack of loyalty from employees.'

The survey of employers and employees across the sector – conducted in recent weeks by Hays – found small decreases in salaries in nearly all the job categories, with the most significant decreases affecting

The salary downturn means firms may find it difficult to recruit the best staff.



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junior staff. Overall, consultant engineers felt the worst effects of falling salaries, compared with contractors and mechanical and electrical engineers. Estimators, however, saw modest increases in their salaries.

In the past, many salaries were inflated due to skills shortages in the industry, according to Hays. In the current climate employees are facing a pay squeeze and, in some cases, a cut in hours.

However, there are now positive signs emerging that the recruitment market is livening up. 'It has been a tough year but we are starting to see more optimism from both employers and jobseekers,' McNally says. 'Recruitment continues to take place with an air of caution and there are hesitant but sure signs of more movement in the market.'

'The landscape of building services has been hit hard over last twelve months but hope is beginning to pervade the market, albeit coupled with some caution. The consultancy market has suffered more than the contracting market but we are starting to see signs of it bottoming out.'

The survey in figures

- 72% did not receive a salary increase in 2009
- 35% say they will change jobs within a year
- 22% favour a move to the energy industry
- 46% have been asked to consider a cut in hours
- 33% agreed to reduce their hours
- 63% have had to consider flexible working
- 70% believe there are not enough new recruits
- 27% say the sector is not seen as exciting to work in
- 23% believe salary/benefits are uncompetitive

Staff across the building services industry say they feel undervalued, with more than a third expecting to change jobs in the next 12 months.

Perhaps more worrying for employers, more than a fifth of professionals surveyed saw themselves as moving into another type of role in the coming year. Respondents cited mechanical engineering (28 per cent), electrical engineering (22 per cent) and the power sector (22 per cent) as their most popular choices.

However, 55 per cent said that they would stay with their current employer if issues such as salary, and training and development were addressed.

'Overall, employers are doing less to retain and attract staff, as they feel as though they are in a strong position to be able to recruit. In some places, in-house training or a promotion is offered to attract prospective employees where the salary on offer may not be very competitive,' says Rebecca Coen, section manager at Hays Building Services.

A huge 70 per cent of respondents feel that there was a lack of people entering the building services industry, with many perceiving this as being down to a lack of understanding about job roles. More than a fifth believe the building services industry is not perceived as an exciting one to work in, and that salary and benefits packages are not viewed as competitive.

Other reasons for the industry's failure to attract recruits were: not many jobs available; lack of visibility of qualifications; and lack of a career path. Key ways of attracting more new entrants to the building services industry include offering clear routes for progression, improved graduate schemes and higher salaries.

Despite employees feeling, for the most part, negative towards their current situation, 85 per cent felt that their work-life balance was either good or

More than a third of building services engineering professionals say they will look to change their job in the coming year.

"It's a tough year but we are starting to see more optimism from both employers and jobseekers"
 – Mike McNally



Almost three quarters of professionals did not receive a salary increase in 2009.

> OK. This may be, in part, due to employees working reduced hours – 63 per cent of respondents have had to consider flexible work options over the last year, 46 per cent had to consider part-time working and 46 per cent had been asked to consider a reduction in hours.

A third of professionals agreed to a reduction in hours and half agreed to flexible working, however only 17 per cent of people agreed to part time working.

Building services continues to be a very male-dominated industry and the recession has done little to redress the balance. The majority of women working within the industry tend to be CAD engineers.

Says McNally: ‘There is still very little being done to attract women into the industry. The financial crisis has meant that it has been even less of a focus for employers and with everything the industry has faced, we don’t expect this to change much over the coming year.’

“Employers are doing less to retain and attract staff, as they feel they are in a strong position to recruit”
– Rebecca Coen

While there has been no real change in the type of experience and qualifications sought, expectations in standards are higher. Employers want niche market experience and there has been an increase in the numbers of employers requesting applicants who are chartered or hold CIBSE membership. Energy and sustainability experience have also become very attractive.

Many of the top 20 consultancies have recently decided that temporary workers should make up a significant proportion of their headcount, some up to 15 per cent, so that they can manage their headcount more easily should they experience problems in the future. Interestingly, some professionals are opting for temporary work, over permanent.

However, says McNally, continuing developments such as the Olympics site in London are expected to help inject new life into the building services profession. And although the Olympics has so far had very little impact upon job levels, this is set to change and candidates are already showing marked interest in being involved in the project in one way or another.

Hays Building Services’ findings are based on information gleaned by its consultants across the UK and from a survey of more than 100 industry professionals. ●

For the full survey tables, go to www.jobs.cibsejournal.com
Also visit www.hays.co.uk/building_services

Shrinking salaries	2010	2009	% change
Annual figures for national-average typical salaries of:			
Consultant – associate	£45,769	£46,538	-2
Consultant – principal	£39,692	£42,923	-8
Consultant – intermediate	£27,408	£29,385	-7
Consultant Junior	£20,823	£23,769	-12
Senior M&E contracts manager	£40,684	£42,153	-3
M&E contracts engineer	£33,907	£35,538	-5
Senior estimator	£40,400	£40,000	1
Estimator	£32,692	£32,808	0
Contractor – operations director	£51,700	£52,846	-2
Contractor – operations manager	£45,592	£46,231	-1

Source: Hays/CIBSE Journal. For the full survey tables, go to www.jobs.cibsejournal.com



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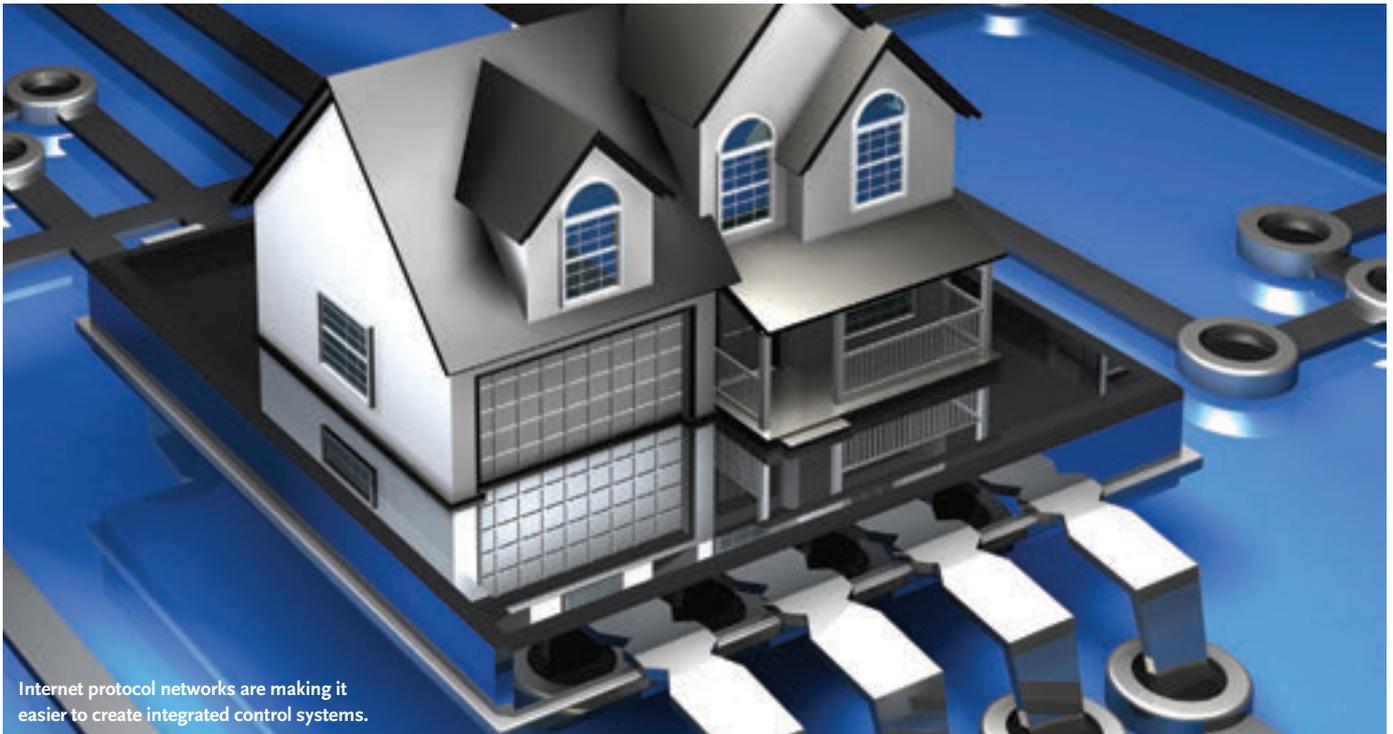
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Integrated controls systems can bring long-term efficiency savings despite their high cost.

Intelligent performer

The internet and smart phones are expected to dramatically change the way that building services controls are deployed. But, asks **Ewen Rose**, will clients and specifiers grasp the efficiency gains that can come from 'intelligent' buildings?



Internet protocol networks are making it easier to create integrated control systems.

Building services controls are becoming cheaper, more flexible and easier to install thanks to the expansion of internet protocol networks, according to experts in the industry. The drive towards web-enabled, integrated networks is inevitable, with more systems migrating onto the IT infrastructure. This, linked to the increasing use of wireless devices, has the potential to slash installation and operating costs and simplify remote monitoring of buildings for energy and security purposes.

Many devices are now able to work with a range of open protocols: KNS is becoming the common operating system for lighting; many devices come with ModBUS built in; and LonWorks and BACnet are already widely adopted by system infrastructure builders.

Despite these technical developments, there remain a number of barriers to the delivery of intelligent buildings, according to Ken Gray, principal at the Performance Building Partnership. He believes there is a shortage of engineers with appropriate integration skills. Another problem is that buildings are delivered in a fragmented way, while developers are risk averse and avoid using integrated control systems.

Clients need to be persuaded that the controls industry can add more value, argues Neil Pennell, head of sustainability and engineering for Land Securities. They are in a competitive environment and need their buildings to give them a business edge, he says.

Reducing capital and operating costs, while also speeding up delivery are crucial, but there is also a major focus on future-proofing, so systems need to be adaptable and flexible to meet changing needs and to manage energy.

However, controls firms are still grappling with some of the inherited problems from traditional 'closed'

proprietary devices that cannot communicate with the new 'open protocol' integrated control systems, according to Gareth Davies of Newera Controls.

'Such devices might do their job very well for a long time, but eventually they will become 'legacy' products that can no longer offer any benefit to the building user,' he says.

The solution is to 'decouple' the existing installations in preparation for controlling them through the 'open' common IT network, so that controls are no longer focused on managing individual devices, but on providing the end user's required solutions.

'Proprietary hardware systems reached their zenith in the 1980s, and the companies that delivered them bestrode the Earth – now those companies are either gone or are doing different things,' says Davies. 'Proprietary systems still exist – many are very robust, quick and good, but expensive. We are now moving to a commodity market that has reduced the cost of the devices and is built on an open platform with control delivered via the internet – this means the industry can be more agile.'

Davies points out that Google believes the smart phone will overtake the PC as the dominant IT product in three years, and this will become the main platform for delivering building automation. The good news for building services engineers, he adds, is that the value has migrated away from the hardware to services: 'Clients will pay for the people who can make their systems work. In many cases, the software is also provided free.'

More integration is taking place away from the 'front end' of the system through distributed sensors and in individual appliances further down the network. The crucial element will be the user interface for the facilities manager (FM), and that should be as simple >

“ There is currently not enough integration between lighting control and general energy management systems ” – Roger Moncur

■ We need to change the facilities management model because systems are often too complex and hard to understand ■

– Darren Burford

> as possible and avoid the need for specialised training, experts argue.

Roger Moncur of Schneider Electric says: ‘Historically our systems were focused on HVAC control and monitoring, but we now have to go far further, especially with the need for broad-based energy control. For example, there is currently not enough integration between lighting control and general energy management systems. We need to work on ensuring lighting is disabled more of the time.’

So, has the industry failed to deliver easy-to-understand energy management tools? If so, the challenge will be even greater for facilities managers once the Carbon Reduction Commitment Energy Efficiency Scheme (CRC) is rolled out.

Darren Burford, of Andromeda Telematics, says that too many FMs see controls as a ‘black art’ because they are rarely involved in the early stages of a project: ‘Also, many systems, which may never have been commissioned or load tested properly, are often out of date by the time the building is handed over. This makes them difficult and expensive to maintain, so our industry has a reputation for being expensive and often unable to get the systems to do what the operator wants them to do.

‘We need to change the FM model because they often end up with a system that is too complex and hard to understand. We need to rethink design, specification and handover of controls systems to make them simpler.’

Derek Clements-Croome, chairman of the CIBSE Intelligent Buildings Group, which recently hosted a seminar on system integration, says the true measure of the success of a controls strategy is the impact it has on the people operating and occupying the buildings. The industry is now being measured on a wide range of social, economic and environmental values, and so it isn’t enough to evaluate the technology for its own sake.

Moreover, some argue, the traditional fragmented process of procurement continues to frustrate efforts to deliver truly integrated systems and intelligent buildings. While technologies exist to deliver energy

savings and other benefits of systems integration to clients, these services are not being delivered as the norm.

This is partly due to the fragmented structure of the supply chain, with the different professionals working in silos. There is also the problem of cost consultants applying ‘value engineering’ and cutting out system integration, while failing to understand the lifecycle value that controls can deliver.

The controls industry has a reputation for being expensive because clients do not take the energy savings possible with integrated controls systems into their calculations. One suggestion is that controls suppliers should be asked to tender on a five-year basis so that clients could make meaningful comparisons between initial capital and on-going running costs.

Another approach could be to engage controls designers on a fee-basis so they contribute to the initial design, thus ensuring the controls are considered before the HVAC hardware is specified and delivered to site.

Whichever technological opportunities are taken up, buildings will remain difficult to achieve unless the industry establishes more integrated teams in place of the traditional ‘sequential’ design approach.

Martin Davis, a member of the Strategic Forum for Construction’s integration task group, says: ‘Integrated teams add value. They get projects under way six months faster for a start.’ He says the combination of the demand for low carbon buildings and the economic crisis meant the time was right for reform of the supply chain. ‘To achieve low carbon targets, we need to integrate the delivery team and bring in the FM at the start. We need to become one team, with individual staff seconded to each other. This will create a culture of shared reward when we get it right and shared pain if we fail.’

Then, and only then, he says, will integrated controls and intelligent buildings become the norm. ●

The CIBSE Intelligent Buildings Group can be found under ‘Special Interest Groups’ at www.cibse.org



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Air-terminal devices are key to cutting inefficiency in air-movement systems.



An air-handling unit is built on site... Components of air systems can be neglected by specifiers.

Filak Woods

Well-prepared grilles

By specifying inappropriate grilles, louvres and diffusers for an air distribution system, you run the risk of condemning the entire system to poor performance, resulting in energy inefficiency, high costs, compromised comfort and unhappy occupants, says **Ian Vallely**

As pressure mounts on consultants to meet the twin challenges of reducing costs and increasing the energy efficiency of the systems they design and specify, there is an inevitable temptation for them to focus on big-ticket items in a heating, ventilation or air conditioning (HVAC) system that appear to have a greater payoff than the smaller commodity-type components.

So, for example, when designing large, expensive air movement systems, they might concentrate on the air handling units and fan coil units and dismiss as relatively unimportant air terminal devices (ATDs) such as grilles, louvres and diffusers.

However, although understandable, this is a mistake because neglecting ATDs can adversely affect comfort levels in a building and is potentially expensive both in terms of the system's running costs and the building's energy efficiency.

Indeed, many industry experts assert that ATDs have an impact on the efficiency of the air management system that far outweighs their size and apparent significance. That, says David Fitzpatrick, sales director, Ruskin Air Management, is why it is worth spending time and effort on their specification.

He believes this could be an issue affecting, perhaps, one in four projects: 'Consultants rightly spend a large percentage of their time designing the system to get the right products in place and [ATDs] are often the last-minute items that don't always get thought about enough.'

'The problem arises because consultants have so

many different jobs to do within a building, and grilles, louvres and diffusers are such a small part of the overall project. However, they can have a disproportionate impact on the effectiveness of the system as a whole.'

There are many different types of ATDs on the market and that is why Fitzpatrick believes it makes sense for consultants to seek the advice of manufacturers on their specification. As he says: 'The problem is not always the quality of the product; it can be down to specifying the right type of product for the particular application.'

A failure to address this can devalue all the effort that has gone into designing and installing the system. Ian Thomas, product manager for components at TROX UK, puts it bluntly: 'The wrong £50 diffuser can ruin a million-pound air conditioning system.'

Craig MacFadyen, applications manager at Fläkt Woods, compares ATDs in an HVAC system to loudspeakers in a hi-fi: 'It is important to have high-quality design and components throughout the system. This, of course, applies as much to air distribution as it does to hi-fi.'

For MacFadyen, ATDs have a particular significance because they are the air distribution system's customer interface: 'They are the product that affects people's perception of the installation as a whole because they are all that people feel, hear and potentially see.'

Ductwork

But ATDs are not the only air movement accessories that tend to suffer when it comes to specification. >



■ Grilles, louvres and diffusers can have a disproportionate impact on the effectiveness of the system as a whole ■ – David Fitzpatrick



Fläkt Woods

Fan-maker Fläkt Woods says it is important to have high-quality components throughout the air system.



“ Air terminal devices affect people’s perception of the installation as a whole because they are all that people feel, hear and potentially see ” – Craig MacFadyen

> Iain Robertson, joint managing director of Lindab, is more concerned about the component that lies behind them – the ductwork.

Ductwork is out of sight and therefore, more often than not, out of mind. However, Robertson believes that taking it for granted can also leave the client seriously out of pocket.

The drive for energy savings has resulted in lower pressure drops within many air movement systems. Although generally regarded as a positive trend, this has significant implications for the quality of the ductwork in terms of its leakage class (‘C’ being the best and ‘A’ the worst).

A properly sealed ductwork system will save energy because it does not have to overcome leakage losses and the fan does not have to work so hard to deliver the correct amount of air.

So, it would seem to make sense to specify Class C ductwork rather than Classes A or B. However, this is not always the case, says Robertson: ‘Most jobs specify Class B ductwork but, by going to Class C, there is a 15 per cent saving in the amount of energy you need to get the same amount of air down the ducting.’

Robertson says he is puzzled about why Class C is not specified more often, especially, he says, because ‘there is a slight price difference [between Class B and Class C ductwork], but it is not significant’.

Like ductwork, ATD selection is not always down to the consultant; contractors can also have a big influence on their specification.

Says MacFadyen: ‘Consultants almost always want the best for their clients; all too often contractors want

the best for themselves, which you can understand because they are there to make money, as everyone else is; but it is important to ensure that what goes in is going to create a comfortable indoor environment.’

He believes that creating a building with a comfortable environment is the responsibility of everybody in the entire supply chain.

For Thomas, this chain can get exceptionally complex. He explains: ‘The architect starts designing his building and by the time we get to our equipment we have one hand and, in many cases, both hands, tied behind our back.’

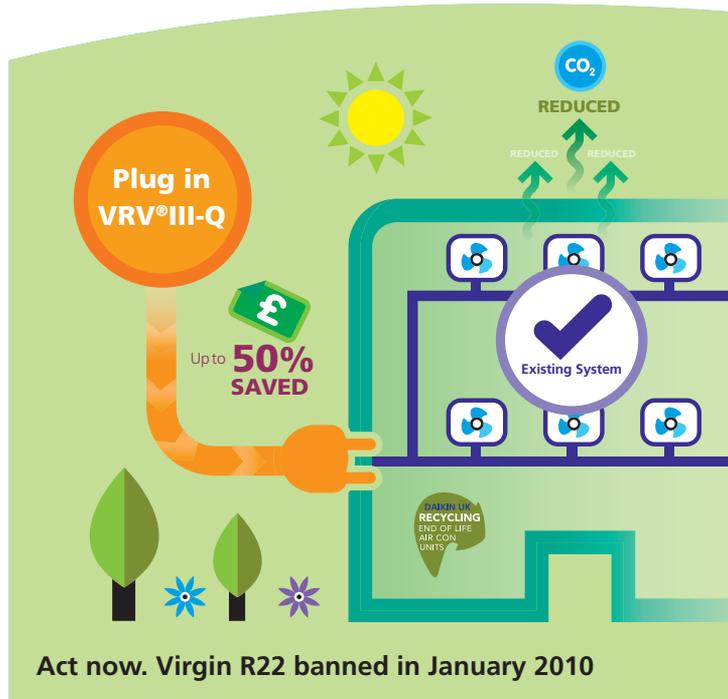
Thomas sees consultants as the go-between between the ATD manufacturer (‘since we are perceived to be the design authority because we know the products’) and the architect (‘whose vision is often aesthetically driven’).

But, he concludes: ‘By the time the manufacturers get involved, the overall scheme of the building is pretty much mapped out so we are trying to bend something to fit and the consultant’s role as the go-between means he is trying to get the elbow room for a workable compromise.’

Systems

Some manufacturers argue that too many specifiers choose the cheapest ATDs available – these are sold as off-the-shelf products and are usually simply filling a hole in the ceiling where the ducting terminates. But grilles, louvres and diffusers work best when they are integrated into the air movement design, using a systems engineering approach. >

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Specifiers should opt for quality rather than lower cost for air-terminal devices.

> This usually means calling upon a single company to supply every part of a ventilation system – typically, either chilled beams or fan coil units, plenum boxes, filters, grilles, louvres and diffusers. In this way, the specifier can benefit from a single source of supply and an integrated system that helps mitigate potential design problems (which could include high room noise levels, poor air distribution and less than satisfactory thermal performance).

It is argued that, with a single point of responsibility, a system can be guaranteed by the manufacturer, and risk and worry can be removed from that area of the project. But systems engineering also offers another advantage – it enables the designer to find and limit unnecessary costs and avoid over-engineering the system. Some industry insiders have estimated that this ‘value engineering’ approach can lead to 10 to 15 per cent cost savings.

Value engineering makes even more sense when variable air volume (VAV) fan coils are employed that require modulating air flow rates. In this case, it is essential that the diffuser will not only operate at peak design condition, but also at reduced air supply volumes.

With VAV, as the cooling requirement is reduced, the fan speed is varied to reduce the air volume. When varying the air volume, it is important that the velocity isn't so low that the air ‘dumps’ (in other words, rather than skidding across the ceiling, the air falls towards the room occupants, thus creating draughts).

Dumping occurs when cool air does not have enough energy to run along the ceiling and there is a significant

risk of it happening if the air velocity falls below 60 per cent of the maximum. Once dumping starts in a room, the air volume must be boosted significantly to get the air back up onto the ceiling and away from the occupants. In other words, considerable energy must be expended to influence the undesirable room air pattern.

That is why it is important to examine the diffuser selection to support VAV fan coils and, preferably, use a device that prevents the diffuser from dumping. So the emphasis is on good selection.

Says Thomas: ‘You can pick up a pair of diffusers and decide they are the same, but the months of testing and proving and acoustic analysis are impossible for people on the outside to see and it is that information that will make the difference between that item working and failing to work in a system.’ ●



“ The architect starts designing his building and by the time we get to our equipment we have one hand tied behind our backs ” – Ian Thomas

How to defeat the diffusion confusion with HEVAC

The Air Distribution Group of the HEVAC Association has published a guide to air distribution called *HEVAC General Specification and Product Directory for Air Distribution and Related Equipment* (August 2004).

It consists of a ‘General Specification and Members Product Directory’ covering the full range of products in some detail and can be downloaded free at: www.feta.co.uk/hevac/downloads/airdistgenspecandpd-augo4.pdf

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Delmatic's cutting edge at The Blade

A Delmatic lighting management system is delivering energy efficiency and a high level of flexibility to The Blade, an office development in Reading, Berkshire.

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Lamps from Megaman (UK) Ltd have been used to provide an effective, low-energy light source for ArcelorMittal's factory in Willenhall, West Midlands. More than 150 high bay luminaires, incorporating Megaman's Clusterlite lamps, have been installed in the 150,000 sq ft facility. All of the lamps are on photo cells to maximise the energy-saving element of the project and Megaman Clusterlite lamps provide a longer life, making them ideal for use due to limited access to some of the lamps.

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College chooses Atlantic Boilers

Lancashire-based Atlantic Boilers has installed rapeseed oil boilers at the Building Crafts College, Stratford, east London.

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Lumicom gives a boost to street lantern recycling

Following extensive field trials, Lumicom has launched arrangements for the disposal of end-of-life street lanterns

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The field trials explored a number of options for establishing an efficient, cost-effective and user-friendly disposal infrastructure for street lanterns. The result is a scheme that will greatly increase the numbers of luminaires being recycled, thus reducing environmental impact considerably.

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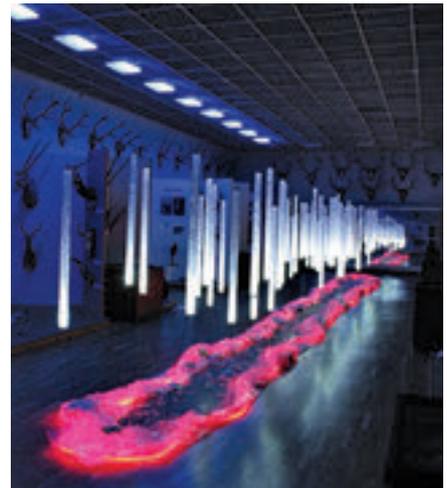


University of Strathclyde chooses Grundfos for M&E

Grundfos has been chosen to work on the M&E solution at the University of Strathclyde's new purpose-built £25m research facility, which will focus on supporting fundamental and applied research into forming and forging – an industry that is currently estimated to be worth £2.1bn.

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TridonicAtco out of the shadows

TridonicAtco has supplied its LEDs for Chasing Shadows, a collaboration between Peter Pritchard of lighting design consultancy Pritchard Themis, and his wife, textiles artist Eleanor Pritchard, at the zoological museum in Kaunas, Lithuania.

Some 66 illuminated 'trees' were hung in the museum's Grand Trophy Room, representing a woodland. These 'trees' were made of paper that was burnt and then sealed into clear acrylic tubes. A white Tridonic LED in each tube illuminated the paper and created a ghostly forest of light.

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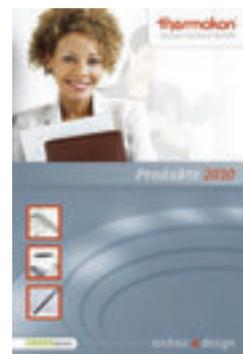
Thermokon brochure at SlaneyDirect

Thermokon's new bumper catalogue for 2010 is packed with 244 pages that include all types of sensors, from room operating panels, pressure, mixed gas-CO₂, light /motion, IO modules, humidity, thyristors, temperature and thermostats, to their innovative wireless system, EasySens.

Divided into individual sections for ease of use, it has many pages of new products, from wireless BacNet receivers to a new range of CO₂ Sensors with traffic-light indication.

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Mitsubishi takes the heat from the kitchen

A high-efficiency air conditioning system from Mitsubishi Heavy Industries Europe (MHIE) is keeping the heat out of a busy kitchen at the Mugen Japanese restaurant in London. Investing in a MHIE inverter split system was more cost-effective than repairing the five-year-old aircon unit, particularly in the light of the forthcoming ban on R22 refrigerant used in many older systems. Choosing one of the latest MHIE split systems also meant that existing pipework and wiring could be used, minimising cost and disruption.

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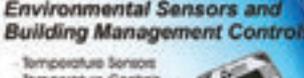
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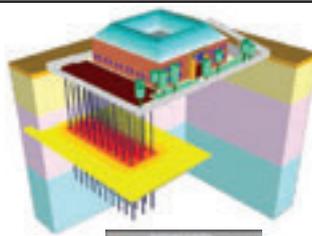
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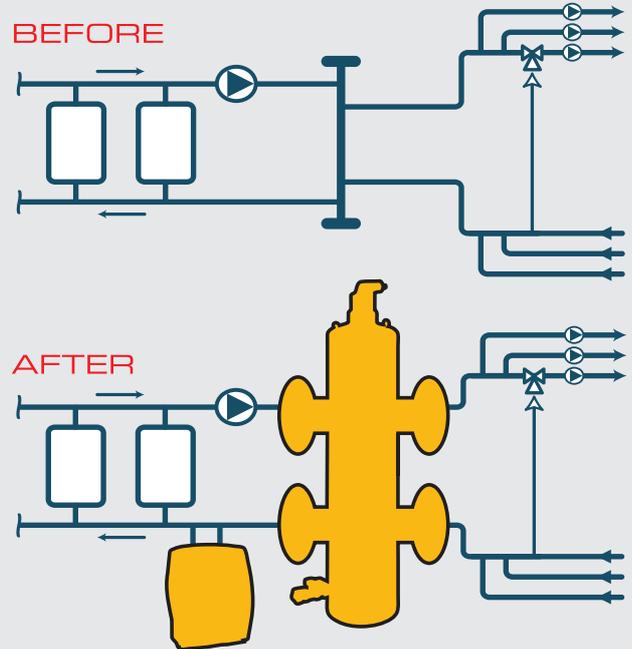
SPIROCROSS & SUPERIOR ON ALL WET SYSTEMS

PROBLEMS...

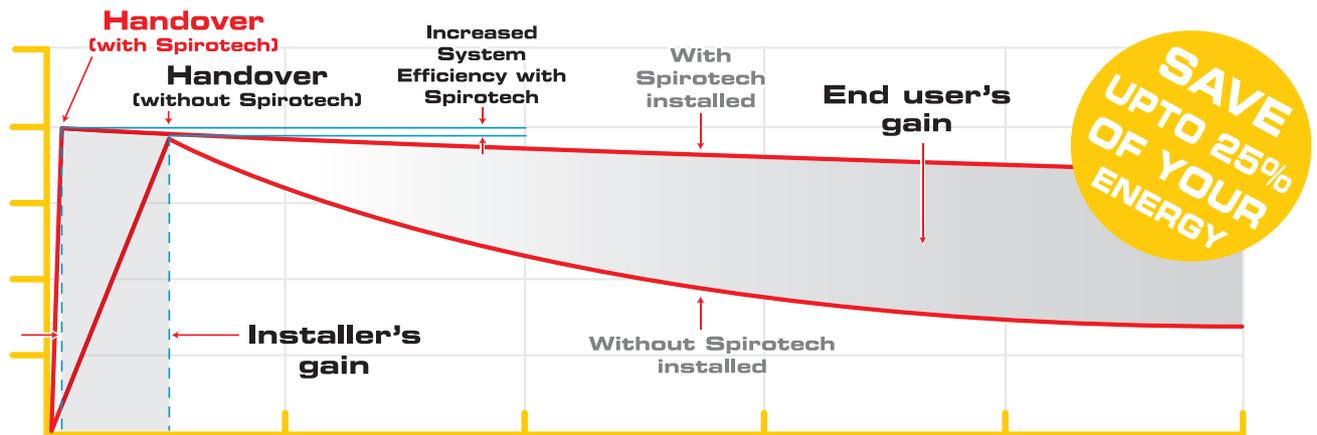
- 1 - AIR RELATED PROBLEMS
- 2 - DIRT CAUSING FOULING
- 3 - EXTENDED COMMISSIONING

CURE - INSTALL...

- 1 - DEAERATION
- 2 - DIRT SEPARATION
- 3 - PRESSURISATION
- 4 - LOW LOSS HEADER



RESULT...



- OPTIMUM OPERATING CONDITIONS [Air and dirt free wet system for life]
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Reducing operational energy consumption by deaeration and dirt removal in water systems

Air, or more specifically the oxygen content in the air, that has entered a piped water system during installation or operation, corrodes the steel surfaces in heating and cooling systems creating the black sludge known as magnetite. The magnetite collects in comparatively still areas, wears out pump seals, blocks up heat exchangers and fouls valve seats. Entrained air affects the pump's ability to efficiently circulate the water, so increasing the power required to drive the pump. This article will outline the methods for deaeration and dirt separation and illustrate the benefits of appropriate equipment application

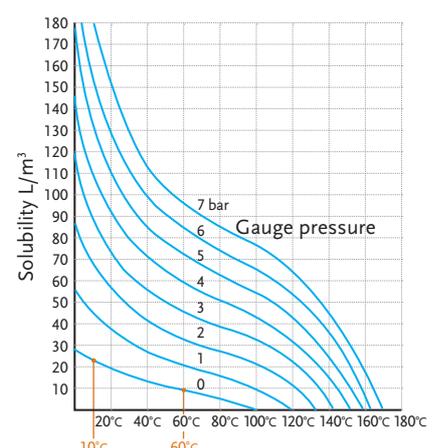
Air in systems

Air will be present in piped water systems both as a result of incomplete purging after the system is filled but also due to the release of dissolved air. The amount of air dissolved in the water depend on the temperature and pressure that may be determined and explained using Henry's Law. Henry's Law is that at a particular temperature the amount of gas that will dissolve in a liquid is proportional to the partial pressure of that gas over the liquid – the potential solubility of air in water is shown in Figure 1.

For example, a heating system open to atmospheric pressure (ie 0 bar gauge) that

is initially full of water at 10°C potentially has about 22 litres air dissolved for every cubic metre of water (22 L/m³). When the low temperature system is heated to 60°C the volume of dissolved air falls to about 10 L/m³ – this released air (12 L/m³) circulates around the system to create the air pockets at high points such as tops of radiators.

Similarly, considering the effect of pressure, for example at a system temperature of 60°C, for every reduction of 1 bar pressure (equivalent to a pipe rise of 10 metres in a building) there is potentially about 11 L air released for every cubic metre of water.



> Figure 1: The solubility of air in water

> **Air removal**

Air will be typically present in piped water systems as a result of the inadequacies of bleeding the system after filling (for example, radiators have a 15mm air pocket that cannot be manually bled out). In addition, no matter at what pressure the system is operating, air will leak into the system through ‘microleaks’, seals, glands and by diffusion through the pipe walls.

Air will increase system noise and pressure drops, and so increase pumping costs or reduce the pump capacity. Components will be damaged such as the ‘pitting corrosion’ of pump impellers from microbubbles (bubbles just a few microns in diameter) and drawing of valve seats.

Following a correct design process, and using a combination of **manual** and automatic air vents (AAVs), the bulk of air can be removed from a piped water system. However, when water is being pumped around the system microbubbles cannot be readily removed by AAVs, as the momentum of the water/air passing under the AAV connecting tee does not allow the air to rise into the air vent. When the circuit is not operating air can gravitate in the still water to the top of the system – this is why AAVs are normally located at the top of risers.

Air separators are normally cheap and rely on relatively low centrifugal forces. They can separate out the larger air bubbles circulating around the system, but will not be able to remove microbubbles because the environment in the vessel remains turbulent, not still.

As air (particularly microbubbles) cannot be efficiently removed in a turbulent zone, specific low velocity regimes are needed so that the bubbles can be eliminated by buoyancy forces (outside the main water flow). Hence the development of the **deaerator** as in Figure 2. Deaerators need either to be



Figure 2: Section through deaerator

tall to create this ‘still’ water environment, or of an increased bore, to create a laminar flow area outside the turbulent waterflow, and thus allow the air to rise naturally and be vented from the system.

The simplest (and most common) deaerators, known as a **temperature differential deaerator**, should be installed close to the point where the bubbles are formed – the system’s hottest point (in a heating system this would be the flow header). As the water cools it will absorb air (for example, air trapped in the top of a radiator) that then returns back to the boiler, in solution. The absorbed air is then released as the boiler reheats the water and then the following deaerator removes a proportion of the released air until, eventually, all the air pockets have been automatically removed by the deaeration process. The water is deaerated to an extremely deep level to the extent that at no point in the circulating system can air be released. The absence of air means oxygen corrosion is so minimised that it almost does not exist.

“As air (particularly microbubbles) cannot be efficiently removed in a turbulent zone, specific low velocity regimes are needed so that the bubbles can be eliminated by buoyancy forces (outside of the main water flow)”

The deaerator should always be installed at the hottest point in the system (on a boiler flow or a chiller return; chilled beams or ceilings require further consideration to locate the hottest point.) For the deaerator to operate properly it must also be located where the static pressure is lower – preferably on the suction side of pumps.

Temperature differential deaeration requires no input from operatives (except for the initial manual venting procedure), and is fully automatic.

These devices operate successfully on heating systems (flow temperature 80°C) with up to a 15-metres static head above the hottest point. With the lower temperatures used in condensing boiler systems the maximum static head for successful temperature differential deaeration is reduced somewhat below 15 metres. For chilled water installations this static head is about



Figure 3: Pressure differential deaerator

five metres. Where the static head is greater than the capabilities of the temperature differential deaerator (as discussed above) a **pressure differential deaerator** (Figure 3) may be applied. A small volume of water is removed from the system water, exposed to a vacuum of 0.05 bar absolute (by using a separate pumping device), deaerated, and returned to the system. This process is repeated until the entire system is fully deaerated equivalent to the 0.05 bar absolute. The unit would normally automatically start each day to produce a deep level of deaeration throughout the system life. Pressure differential deaeration is automatic, but does require annual maintenance because of the active components.

While temperature differential deaeration probably accounts for 90 per cent of commercial installation deaeration, the remainder uses pressure differential deaeration. In conventional domestic installations temperature differential deaeration is normally suitable.

Dirt removal

Dirt (such as sand, swarf from pipe cutting, plastic, welding slag etc) will enter a piped water system while it is being fabricated. Systems should thus be properly flushed prior to use. However, inefficient flushing will leave some of this debris in the pipes and, once in operation, scale and particles from corrosion will also accumulate.

This can block heat exchangers – particularly more modern low water content heat exchangers; heat emitters and underfloor heating pipes become partially blocked and the heat output is reduced.

A common way of reducing particles in



Figure 4: In-line dirt separator

piped water systems is to incorporate a filter or a **strainer**. There is always a compromise when using strainers – large mesh sizes allow larger particles to pass through, while a finer mesh will collect a large volume of particles rapidly, potentially leading to obstruction of the waterway. To prevent problems, and ensure that system performance does not suffer, strainers are provided with apertures that allow all the by-products of corrosion to pass through or they would block up. Specialised **dirt separators** (as shown in Figure 4) remove particles down to $0.5\mu\text{m}$ (compared to strainers that typically only remove down to $1,600\mu\text{m}$).

Manufacturer tests have shown that, during the normal commissioning period, the separator will remove approximately 90% of all circulating material, which can then be



Figure 5: Combined deaerator and dirt separator

‘blown down’ through the valve at the base of the separator.

In operation a dirt separator would normally be blown down at building handover and quarterly thereafter. Maintenance is typically then no more than five minutes in a year.

Dirt separators can remove any dirt particle, not just magnetic dirt, provided that the particle is heavier than water. As with the deaerator, dirt separators require a still water zone to remove all dirt particles that are heavier than water. Fitting dirt separators into existing systems has reportedly shown impressive reductions in solid matter. One particular independent test saw the dirt content reduced from 620 g/m^3 (sized 5 to $10\mu\text{m}$) to less than 1 g/m^3 of all particulates larger than $0.45\mu\text{m}$ following the installation of a dirt separator, over a seven-week period.

Combined deaeration and dirt separation

A combined deaerator and dirt separator (shown in Figure 5) reduces the cost and space requirements compared to separate devices.

Conclusion

By achieving an air and dirt-free system components will have an extended life and increased performance. By applying modern deaerator and dirt separator technology this can be achieved to a higher level without the need to clean strainers and without onerous maintenance requirements. Temperature differential deaerators need little or almost no maintenance, and dirt separators typically require blowing down for the first two to three months – then just a quarterly blow down lasting around 5-10 seconds. Thereafter, pressure differential deaerators require annual maintenance and solenoid valve diaphragm replacement. Hence wear on equipment will be reduced, and maintenance costs on heat exchangers, pump seal replacement and radiators will be lower, with consequent improvements in effectiveness and reduced operating costs.

Case study one: example of reduced maintenance through dirt and air removal – Holland

This was undertaken in an apartment block built in the 1970s using two-pipe heating systems. The boilers were replaced in 2005, and then in 2007 an investigation was undertaken comparing the use of air and dirt separators in three similar buildings – one fitted with a combined air and dirt separator; one with a dirt separator; and one with

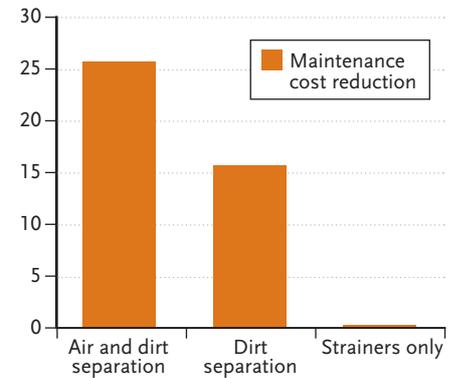


Figure 6: Case study one – impact of deaerators and dirt separators on maintenance costs

standard strainers.

The cost of maintenance in the three buildings was recorded and the normalised values are shown in Figure 6. The system with the combined dirt and air separator required far less maintenance to ensure effective operation of the systems by reducing the dissolved air as well reducing the amount of ‘dirt’ in the system by 27 per cent compared to the previous year. By comparison, the system that used dirt separators reduced maintenance by 17 per cent.

Case study two: Reduction of pump power through deaeration – Beijing, China

An existing heating system was designed to supply $103\text{ m}^3/\text{hour}$ (28.6 L/s). However when in operation large fluctuations in flowrate were observed, although the pump was maintained at constant speed. The system was monitored both before and after the fitting of a deaeration system. The effect of the deaeration may be clearly seen on the outline pump/system curves shown in Figure 7. Deaerating the system effectively reduced the system resistance so moving the operating point from one to two, employing a smaller impeller and reduced pump head. This reduced the power input to the pump by 31% compared to the original system without a deaerator.

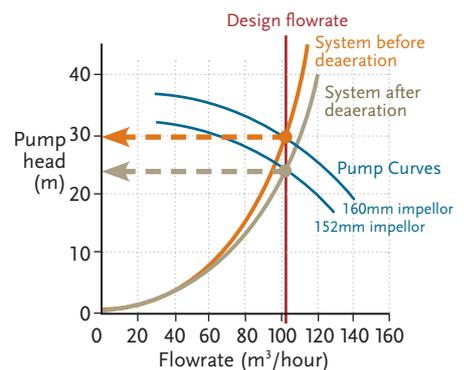


Figure 7: Case study two – pump power reduction through deaeration

Module 16

May 2010



1. If water at 20°C and 1 bar gauge is heated to 60°C, what is the potential amount of released air into a system?

- A 10 L/M³
- B 15 L/M³
- C 20 L/M³
- D 25 L/M³
- E 30 L/M³

2. In the article what was the main reason given for typically installing AAVs at the top of risers?

- A To trap microbubbles when the system was operating
- B To ensure that they did not get blocked with magnetite
- C To provide an area of still water to allow air to rise
- D To capture air that naturally gravitates to high points
- E To reduce pitting corrosion on the valve

3. Temperature differential separators principally operate at which of these conditions?

- A By providing a 'still' water environment at a point in the system with a higher temperature
- B By providing a high system temperature and high pressure
- C By allowing the temperature of the water to drop in the large vessel
- D By setting up a temperature difference between the top and bottom of the large vessel
- E By removing the air when the whole system cools down

4. Pressure differential separators operate by which of these methods?

- A Being installed at a low pressure point in the system
- B By repeatedly deaerating small samples of water by reducing the pressure
- C By connecting across two points in the system to benefit from the pressure difference
- D By providing a 'still' water environment at a point in the system with a higher pressure
- E By removing air bubbles through manual operation of a vacuum pump

5. Which of these is unlikely to be true for a properly-installed dirt separator?

- A They normally need operating maintenance of a few minutes each year
- B They remove magnetic dirt only
- C They remove particles heavier than water
- D They operate by providing a 'still' water environment
- E They can be combined into a single unit with a deaerator

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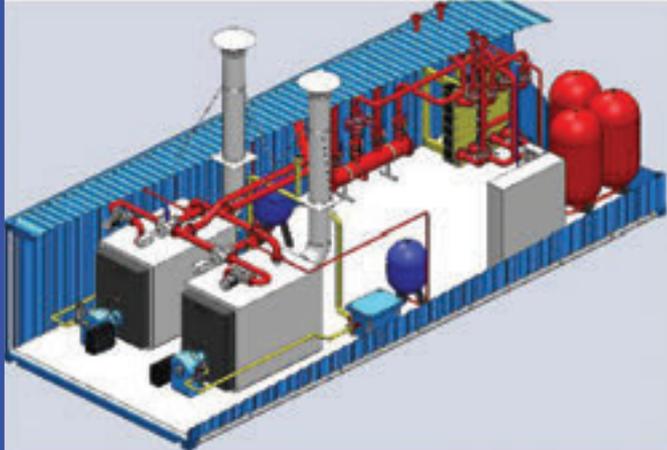
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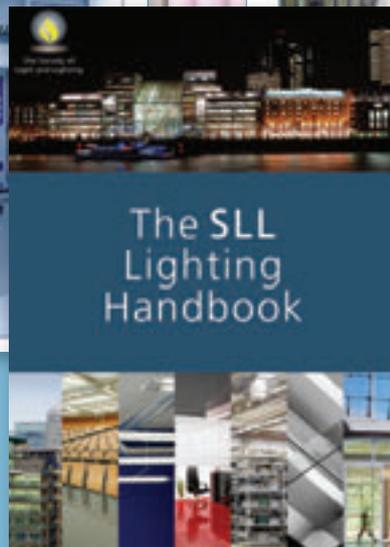
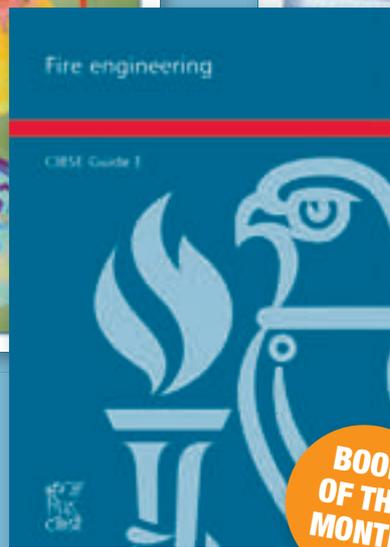
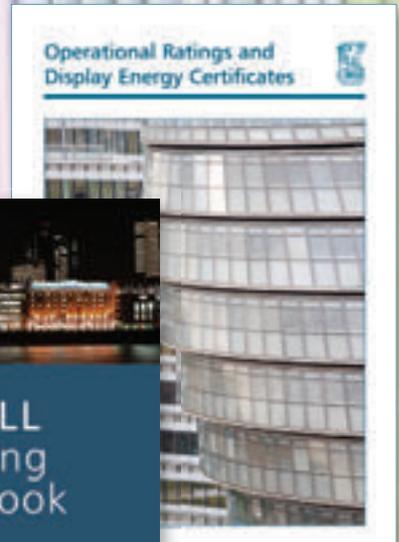


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- CIBSE publications provide practical information and best practice guidance on a range of building services and energy topics.
- Publications range from the very technical to the hands on and cover a wide variety of subjects. They will be of benefit to those working throughout building services and the built environment, including: designers, facilities managers, contractors, lighting specialists and architects.

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BOOK OF THE MONTH



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IT and Communications Consultant	<i>London</i>
Environmental Modellers	<i>Flexible Location</i>
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Closing date: Sunday 9th May 2010.
Interviews will be held in May 2010.

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REF: BAR346

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REF: BAR441

Chief Electrical Engineer

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Our client is a leading UK consultancy specialising in the provision of planning, design and management services for infrastructure development worldwide. This position represents a fantastic opportunity to involve yourself in the Crossrail project, the impressive, innovative, and visionary new high frequency railway for London and the South East. The successful candidate should be degree qualified and have the ability to demonstrate extensive experience of Railway/ Station design works coupled with significant management experience and the ability to focus on targets and achieve deliverables.

REF: BAR439

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Excellence is all

Andrzej Krawecki, design engineer for Ramboll, explains the importance of technical prowess

After completing his building services degree at Glasgow Caledonian University, Andrzej Krawecki thought that he would return to his native Poland straight away.

However, he was spotted by the local consultancy ACTS Partnership and, shortly after, started working for Ramboll M&E consultancy in Manchester.

He has come a long way from helping more experienced colleagues in an office-based role. Now, as a design engineer, he leads Ramboll Manchester's involvement in the sports sector, working on a day-to-day basis on the £16m Knowsley Sports Park.

'My career is developing just as it should do,' says Krawecki. 'I'm busy with a few projects at once and the days are never the same in the office or on site.'

Krawecki, 29, thinks young engineers should publish more technical papers and opinions, such as his article on sports halls and their environmental conditions, which appeared in *Building Services Journal* in 2008. He explains:



'Understanding how to write an article has helped me a lot in my career. It's a win-win situation; you learn in depth about the subject you're working on, deepen your knowledge about writing a technical piece and gain a sense of achievement seeing your work in front of the entire industry.'

He continues: 'I do enjoy building site visits because that's what engineering is about.'

'Sitting in the office and running thermal models is one thing, but when everything comes together you can see if your system was

good enough.' To be a good engineer, Krawecki believes the first requirement is technical excellence: 'The ability to overcome technical problems has been recently underestimated by almost everyone.'

At design team meetings every team member looks at you as the engineering guru and you have to be able to explain the strategies and technical merits of your design. After all, putting symbols on drawings can be done by anyone – but knowing why they've been put there is a job for an expert.'

He deals with the teams he works with in a simple way: 'I try to be available as frequently as possible for a technical conversation with any person within the project. Very often time spent at the beginning of the job, explaining M&E strategies and putting full information on the drawings, has the benefit later of not having to "waste" your time convincing people of your proposals.'

Krawecki is already a chartered engineer and enjoys mentoring his colleagues, aiming for excellence in every aspect. His goals for the future include promoting profitable low and zero-carbon systems and leading his own consultancy.

Email your latest people appointments and role profiles to cbailey@cibsejournal.com

Movers & Shakers



Hugh Parry, CEng MCIBSE, has joined Flatt Consulting as a technical director. He will

work alongside the current management team to further develop the company's building services, low-carbon design and sustainability business.



Paul Kingswell has been appointed commercial manager at Jaga Heating

Products. Kingswell's appointment to this newly-created position signals Jaga's ambition to be a leading player in energy-efficient heating and ventilation systems.

Engineering and technology expert Siemens has confirmed the appointment of **Barry Glew** as managing director of its UK building technologies division. Glew is joined on the executive team by Lee Shimwell, who takes on the role of finance director.



Multidisciplinary consultant Atkins has announced a management reshuffle. **Tim**

Askew (top), currently managing director of the group's Middle East division, is to become managing director of its



water and environment business. **Richard Barrett** (middle), currently

managing director, Europe, becomes managing director, Middle East. And **Chris Birdsong** (bottom) will become managing director of the European portfolio, plus being MD of the group's management consultants business.

The British Institute of Facilities Management has announced **Ian Broadbent** as its chairman for the next two years.

CIBSE's new fellows, members and associates

Three CIBSE members have been promoted to fellow this month, while 11 people have become members of the institute, plus there is one new associate. The full list is:

FELLOW

Keith Armstrong	Gateshead
John Humphries	Washington
William Yates	Leicester

MEMBER

Ronaldo Dalistan	Qatar
Chiew Peng Chuah	London
Andrew Horne	Oxford
Stuart Fleet	London
Nicholas Herd	Chester
Ka Man Lai	Hong Kong
Ronan Meally	Ireland
David Pembury	Bristol
Tak Yeung Tam	Hong Kong
Enkuang Yang	USA
Stuart Humber	London

ASSOCIATE

Trevor Scarrow	Doncaster
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Members who have been promoted to fellow this month are:



Keith Armstrong is a regional director at multidisciplinary consultancy, AECOM. He is responsible for the operation of

the buildings engineering division in AECOM's Newcastle office. He is currently chairman of CIBSE North East.



John Humphries is the building services partner for KWM Consulting Engineers LLP, with more

than 32 years' experience in the

electrical engineering industry. He is currently responsible for projects in the UK, Eastern Europe and the UAE. John is also involved with the Society of Light and Lighting and holds the CIBSE Lighting Diploma.



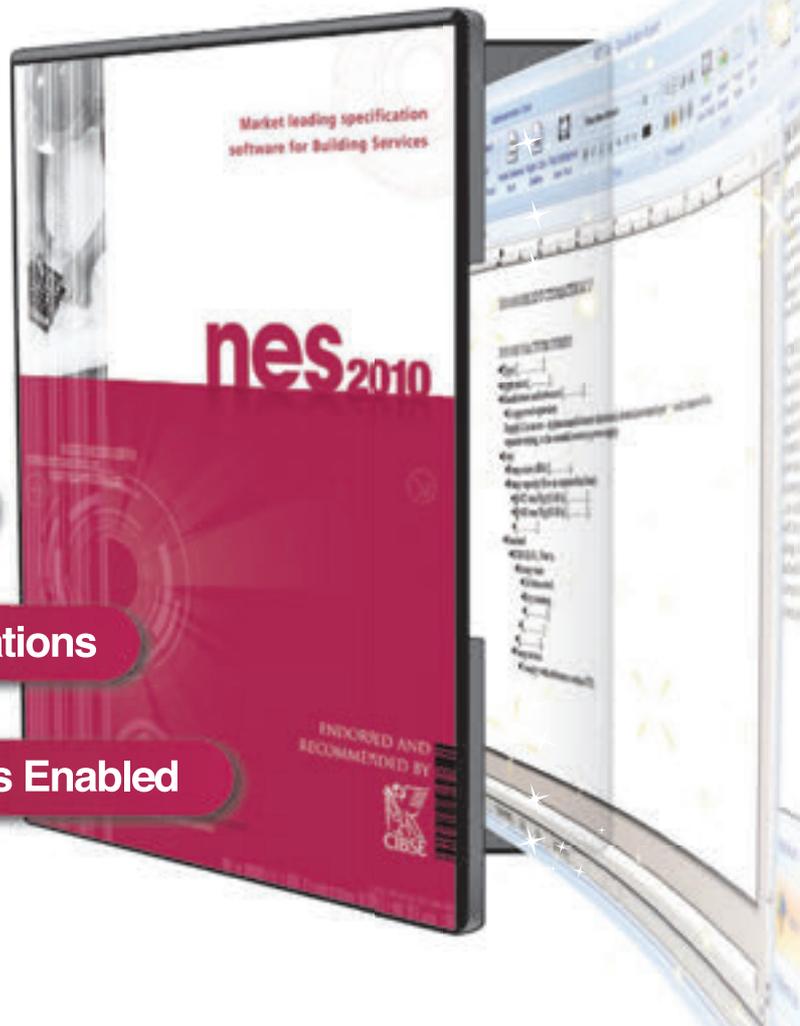
William Yates is the principal partner of WJY Consulting and the former head of mechanical and electrical engineering

services at Leicestershire County Council. He is a chartered engineer and a fellow of the Royal Society for Public Health, with more than 50 years' experience in the building services industry.

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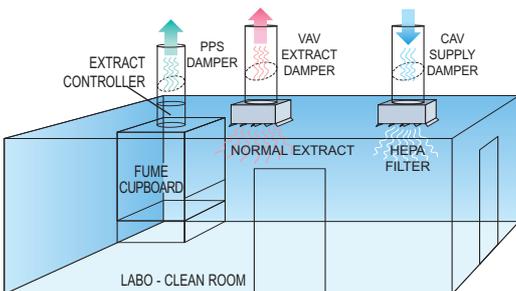


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