SoPHE
JOURNAL

Volume 15 | The Quarterly update from The Society of Public Health Engineers | Issue 4

THE NEW SOCIAL NETWORK

The growing success of the Young Engineering Network

Page 4

Open Water

The competition for supplying Water Services in England

Page 3

Thinking outside the box

Taking a closer look at the design of heat newtorks

Page 6

Taking the heat out of cold water

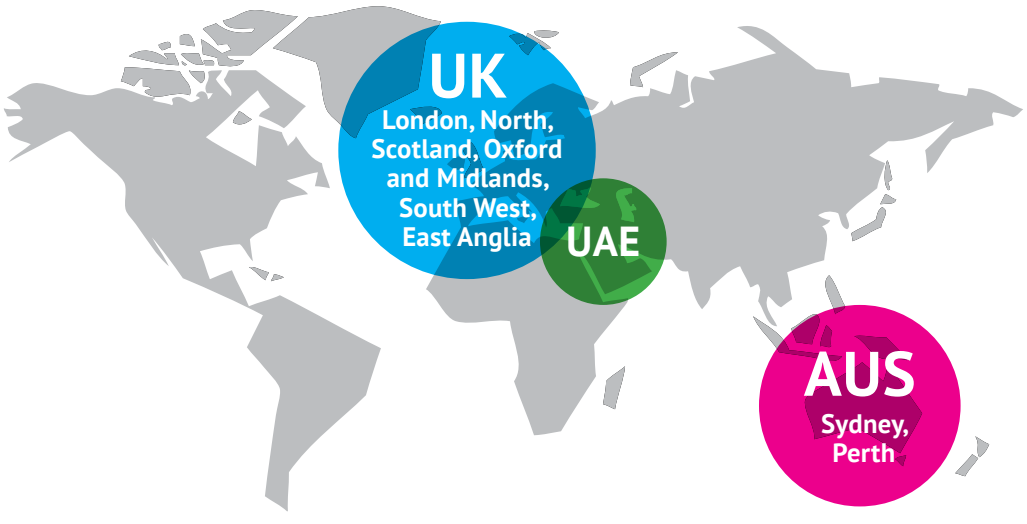
How to avoid overheating in cold water systems

Page 7

Plus the Latest News, WRAS update, Technical Perspective, Regional Round-Ups and forthcoming Events

The SoPHE network

SoPHE is an international organisation that aims to provide a higher profile and focus for public health engineers within CIBSE. We run technical events, site visits and provide support to our members around the world.



The SoPHE LinkedIn group is an ideal platform to reach out to your SoPHE colleagues to discuss new technologies, raise technical queries and keep up to date with whats going on with SoPHE in your region.

You can also follow the latest updates on Twitter @The_SoPHE

In this issue

Welcome to your newly named SoPHE Journal, formally the SoPHE Newsletter. We would first like to thank Paul and Jonathan for all their hard work producing the previous edition, we hope we are as successful as they were and wish them the best of luck in their new roles within SoPHE.

With our membership and professional network growing, the time was right to update our main publication as something that better reflected SoPHE moving forward.

The redesign process has enabled us to create a stronger visual style and review the overall structure and layout, giving it a more modern design. The larger format, new typefaces and use of colour, all work to make it easier to read and find your favourite pieces. You'll also see we have a new masthead, bigger photos and a cleaner, bolder layout with more flexibility in how we can set out each page. We hope you like the changes. Do let us know your thoughts: you can email the team at info@sophe.com.

You will see that there has been a lot of new starters and changing of positions within the group over the last 12 months, while it may have taken these people a little time to find their feet, you will see from comments made within this edition, there is a lot to come from the SoPHE group in 2017.

Steve Vaughan, our SoPHE chairman touches on growth during 2016 (we hope this will continue as we look to continue to promote Public Health Engineering worldwide), and what our members can expect to see during 2017.

This is the first and last edition of 2016 therefore we wish you and your families a very Merry Christmas and good health for 2017.

Regards,

The SoPHE Editorial Team.

CIBSE SoPHE TB 01-16

The first SoPHE technical article has been released.

TB 16-01 provides interim best practice guidance for assessing domestic water demand for pipe sizing in various applications that can be used until such time as further research is completed (e.g. LUNA project) and/or new design standards have been published.

Climate change

The national planning policy framework (NPPF) sets out how the planing system should help minimise vulnerability and provide resilience to the impacts of climate change.

SoPHE 10th Annual Dinner London

The 10th annual dinner was held at the Royal Garden Hotel in December. The Dinner was a very successful evening with a complete write up coming in the next edition of the SoPHE Journal.

Technical publications

BSRIA: Heat Interface Units (BG62/2015)

A heat interface unit (HIU) is an essential part of the efficient delivery of heating and hot water to consumers on district and communal heating schemes. The HIU provides safe connection of the consumer's space heating and hot water systems to the primary heat supply network together with the control function and metering.

BRE: Digest 365 Soakaway design. 2016 revision

Describes design and construction procedures together with explaining how to calculate rainfall design values and soil infiltration rates, and gives some design examples. The 2016 edition includes SuDS descriptions, flood management and Environmental Agency recommendations regarding climate change effects. Supersedes previous revisions of Digest 365.

Controlling legionella in potable hot water systems in buildings (CPD module)

CIBSE Journal, May 2016 (Supplement issue)

This CPD module explores solutions for reducing the impact of legionella bacteria on building occupants. From 2011 -2013, 84 deaths form Legionnaires' disease were recorded in England and Wales (including overseas travellers), with most deaths occurring in people who were 70 years of age or older. This article expands on the material that was covered in the CPD articles (April 2015 and October 2015), as well as highlighting other sources of guidance and active measures when considering potable hot water systems that are aimed at reducing the impact of legionella bacteria on building occupants.

BS EN 12897:2016 Water supply.

Specification for indirectly heated unvented (closed) storage water heaters. Publication date 30 June 2016. Replaces BS EN 12897:2006

CIBSE: CP2 Surface Water Source Heat Pumps: Code of Practice for the UK - Harnessing Energy from the Sea, Rivers, Canals and Lakes

This Code of Practice has been produced as a joint project between the Chartered Institution of Building Services Engineers (CIBSE), the Heat Pump Association (HPA) and the Ground Source Heat Pump Association (GSHPA). The work has been supported by the UK Department for Energy and Climate Change (DECC).

BS EN 13121-3:2016 GRP tanks and vessels for use above ground. Design and workmanship.

Publication date 30 April 2016 Replaces BS 4994:1987, BS EN 13121-3:2008+A1:2010

Proudly supported by

CIBSE

Editor: Daniel Collins
Daniel.Collins@wspgroup.com

Publisher: Visible Futures
nigel@visiblefutures.com

HEATRAE SADIA
SMARTER | CLEANER | WARMER

This edition has been produced in association with Heatra Sadia.

Contact SoPHE

Telephone: +44 (0)20 8675 5211
Email: sophe@cibse.org

Find out more at www.cibse.org

A word from the Chair

In this edition, **Steve Vaughan** talks about the great work of members, future challenges and providing a training structure for our new recruits...and not word about Brexit or Donald!

It appears to me that 2016 has gone in a flash and we're heading towards 2017 at breakneck speed; my children say it's my age...fair comment! Although the time has flown by since I became Chair, our society has taken every opportunity to develop many new activities and initiatives for your benefit.

My main objective as chair has always been to grow a society that provides exceptional value for our members and in the last twelve months we have certainly packed in an awful lot, from developing a series of Technical Bulletins, building a hugely proactive young engineers group and expanding our regions both in the UK and overseas, to name but a few. And of course this new look publication!

In the past year we have welcomed more than 500 delegates to our regional CPD's, Industrial Associate sponsored events as well as now more than 700 members (50% increase since 2015). These are figures we should all be very proud of. The newly formed SoPHE Young Engineers Group has also been a significant development, providing a platform of support to inspire the next generation of Public Health Engineers as well as providing valued input into the society to ensure we can plan for the future. The fresh enthusiasm of the group has also been truly inspiring to me!

With regard to the Steering Group a few changes took place in September. Both Ian Fellingham (Education Chair) and Martin Shouler (Honorary Treasurer) stood down prior to the AGM following their impressive tenure, between them clocking up more than 20 years on the Steering Committee. Both have provided unprecedented commitment and support to the society, without which we would not be where we are today. On behalf of the society, as well as on a personal level, I would like to thank them for their dedication and support. I have no doubt that Ian and Martin will continue to have an active role in the society and our industry. Paul Angus also departed as Communications Officer earlier in 2016 after two fruitful years at the helm as our newsletter editor from down under. Another big loss, but thankfully Paul isn't one for sitting back, so he was quick to jump at the chance to step into the vacant Treasures position. Similarly, Jassim Daureeawo and Peter White were both keen to move into the vacant Technical and Education Committee Chair positions. We look forward to them bringing new ideas and plans to the fore, such as technical bulletins and training modules.

So this brings me onto the last vacant position within the Steering Group, namely Chief Communications Officer. I am pleased to announce that Daniel Collins stepped forward to take up the challenge. So together with the support of a newly appointed journal production house, Daniel and Craig Chamberlain (IA Communications Officer) we now have a very different publication. I do hope you like it as much as I do.

Providing support to worthy causes has always been a big element of our Society's ethos and teaming up with WaterAid has played a significant part of this in the past, this year they felt it was time to move on leaving us free to consider new opportunities. To this end the society will be engaging with a new charitable organisation very soon and are also considering alternative awards, competitions and even a bursary. More details to follow in the next few months.

We've also seen the Contractors Group maintain a steady growth with the continued support of our Industrial Associates and we're now considering setting up a Compliance Group which would allow regulatory authorities, associations and institutes to directly support our society which will bring another great dimension to our structure. In the pipeline is also a Compliance Group, more about that in the next issue.

Collaborative working has continued steadily this year but by far the biggest achievements to date are Peter White and Lynne Jack representing SoPHE by recently presenting a technical paper at the American Society of Plumbing Engineers convention in Arizona, US as well as the significant progress that has been made to set up new regions in the UK and the UAE. We have also continued to support the University of West London's research into building services design for extreme weather climates.

I'm sure you will agree that providing a strong training platform for our future engineers is a big challenge. We believe that if there is a basic structure, we will be able to provide a training platform for the next generation of public health engineers, as we all know how desperately young fresh blood is needed in our industry. It's a tough challenge and one that many have been chipping away at for several years but I believe with your support and CIBSE' platform we can make and are making meaningful progress. If you would like more information or can assist please let me know.

So with so much going on, not only have I probably forgotten to mention something (London annual dinner review planned for the next issue) please be sure to check out the CIBSE SoPHE web page and SoPHE LinkedIN groups for the latest information..

Finally, thank you for supporting me and the society during the first half of my term a Chair, it has been a real pleasure. I wish you well and hope you are enjoying being part of our wonderful society and of course reading our new look Journal.

Best regards,

Steve Vaughan
SoPHE Chair

chairman@sophe.co.uk

Industry Working Group & Industrial Associates update

As Chair of the SoPHE Industry Working Group (IWG) I would like to give you a brief update on our activities. The IWG now has 63 member companies and is continuing to grow. Our main aim is to support the SoPHE chairman, Steve Vaughan, in all the areas that his committee pursue to further the societies knowledge in all aspects of public health engineering.

To enhance this support even further the IWG have recently increased the number of our committee positions that mirror those on the steering group, this enables each of Steve's team to have a direct contact within the IWG. We believe that this close working relationship assists the steering committee not only with technical product knowledge, but coupled with IWG funding, it enables the society to increase the number of educational and social fund raising events.

The IWG recently sponsored a trip for the SoPHE Young Engineers Network (YEN) to the NSF test facility in Wales. This test house is the major provider of tests for WRAS certification in the UK and the trip gave the YEN an opportunity to understand why WRAS approved products are so important to Public Health.

The IWG also organise and fund the two main events for SoPHE each year which are the Annual Dinner held at the Royal Garden Hotel in London, and the Northern Dinner at the Midland Hotel in Manchester.

The SoPHE IWG continues to grow and the Contractors Working Group (CWG), that is currently part of the IWG, will soon be large enough to form their own committee. Now with the CWG the triangle will be complete, consultants, manufacturers, and installers all working together for Public Health Engineering.

Mike Darvill

Open Water

Competition for supplying Water Services in England

From April 2017 1.2 million more non-household customers for water and sewerage services will be able to choose their supplier 7, in a bid to increase competition. Arrangements for this overhaul of national water services and its implications for the Water Fittings Regulations are outlined.

Changes afoot

Since privatisation in 1989 most premises have been supplied with drinking water and sewerage services by the local water company in whose region they are located. Only business customers using more than 5 million litres of water annually (50 million litres/year in Wales) might have used a different supplier.

From April 2017, England follows the lead taken in 2008 by Scotland to introduce greater competition. Eligible non-household premises will be able to switch suppliers of drinking water and/or sewerage services in a similar way to switching energy suppliers at present. The Welsh Government is said to be watching how the exercise goes in England before considering changes.

The potential benefits of greater competition are lower prices, fewer bills and simpler tariffs for businesses which have multiple sites, and better customer service, especially through added-value services such as water efficiency advice.

New market organisation

Existing water and sewerage suppliers will separate their services into wholesale and retail divisions. The wholesalers will continue to own the treatment and distribution assets, producing wholesome drinking water and treating waste water. They will carry out the delivery and collection of water via networks of pipes to and from customers' property boundaries. They make these services available to all retailers via published tariffs. These activities will continue to be regulated by Ofwat.

The retailers will provide customers with billing, account handling (payments, debt management, meter reading) and answering queries, as well as water-efficiency advice and tackling leaks on customers' pipes. New retailers will come into the market in addition to most existing water companies offering 'retail services'.

The Open Water programme was set up with Defra, Ofwat and a new body, Market Operator Services Ltd (MOSL). MOSL's role is delivering the core systems and processes that will enable customers to switch between suppliers. MOSL publishes guides to the industry and the competition process (www.mosl.co.uk/about/our -work).

Who can switch?

Who can switch depends upon the primary purpose of your premises. In England, it will depend on whether your premises are used mainly for business, rather than domestic use, and whether your existing supplier is based in England. For example, a university hall of residence water supply would be eligible to switch as the building exists to support the university's objective to provide educational services. Household customers, non-eligible businesses and businesses which choose not to switch should continue to be served by their incumbent regional water companies through their retail divisions, although Thames Water, Southern Water and Portsmouth Water have announced they will exit the retail market. Premises in Wales, or whose existing supplier is based in Wales, may only be able to switch if using more than 50 million litres/year. For reference, in Scotland non-domestic users may choose regardless of their annual consumption.

Premises using more than 50 million litres/year may be eligible to 'self-supply' by applying for a retail water licence, which will enable them to buy services directly from one of the wholesalers.

> Although the switch cannot happen until April 2017, customers with eligible premises can renegotiate or shop around now.

Finding a new supplier

Customers who wish to switch will contact their chosen retailer who will make the necessary arrangements supported by the market operator. Although the switch cannot happen until April 2017, customers with eligible premises can renegotiate or shop around now. A list of potential retailers of water and wastewater services is available on the website of Open Water (www.open-water.org.uk/for-customers/find-a-supplier/).

New connections and customer contacts

Similar to the present new connections process, the key difference is that before the premises is connected a customer must nominate a retailer, or one will be automatically appointed for them. Water for building construction will be included in the market irrespective of the buildings' use. Retailers will have the primary relationship with customers. Wholesalers have very limited access to the retail customers' details and only for specified purposes, and in general they will not communicate directly with them. Special provisions are made for matters such as water quality, water fittings and trade effluent checks and communicating interruptions to service caused by wholesalers' planned work or by unexpected incidents and emergencies.

Water Fittings Regulations

In contrast to most other customer-facing duties, enforcement of the Water Fittings Regulations and Byelaws is retained by the wholesaler, and the responsibilities of owners, occupiers and installers are unchanged. The wholesaler's prior consent of plumbing proposals is still required via notification. Inspection of plumbing in new and existing premises will continue. However in the case of planned inspections, retailers will have the option of attending. Retailers will be informed about the outcome of all inspections.

<< The potential benefits of greater competition are lower prices, fewer bills and simpler tariffs for businesses which have multiple sites, and better customer service, especially through added-value services such as water efficiency advice.

The Social Network

The Young Engineering Network

This year has seen the launch and growth of the SoPHE Young Engineer Network (YEN), with the group holding a number of events throughout the year, including CPDs, site demonstrations and networking events.

The SoPHE/CIBSE YEN pub quiz

This year the traditional CIBSE YEN London January Pub quiz had a bit of a twist as it was run in conjunction with SoPHE YEN. The event took place on the 14th of January 2016 at the Grafton Arms near Euston Square. It was an opportunity to meet with young engineers from different backgrounds and disciplines while testing their knowledge and having a drink.

The pub quiz was organised and hosted by Jason Smith (CIBSE YEN) and Ruth Howlett (SoPHE YEN) and kindly sponsored by AO Smith. It was highly successful with six teams comprised of four contestants each attending the event. The teams were split evenly between the two networks so there was a bit of friendly competition.

Rounds consisted of General Knowledge, Pictures, Common misconceptions and Engineering. It was refreshing to see a couple of Public Health related questions, as well as a wide variety from the Building Services disciplines.

The first two rounds were kept similar to a traditional quiz. There was a break for food and a chance to network with other teams before getting under way with the final rounds. As the engineering questions started to appear there was a bit more head scratching than when it had begun. Though in true Young Engineers spirit, everybody was forgiven for not knowing everything just yet.

The winners were “insert hilarious name here” and took home £20 gift vouchers each in what was a great evening.

Urban Golf

Tuesday 16th February saw the launch event of the SoPHE YEN London group with a social evening held at Urban Golf in Soho, sponsored by the SoPHE Industy Working Group. The evening started with introductions by Ruth Howlett (Chair, SoPHE YEN), Steve Vaughan (Chair, SoPHE) and Mike Darvill (Chair, SoPHE IWG).

Ruth spoke about why the group had been set up and how it intends to encourage more young engineers to be interested in and aware of public health engineering as a career choice. This included aims of holding further educational, CPD, and social events on a regular basis in the future.

Steve and Mike both iterated the importance of promoting the future of the industry through young engineers and how the group will receive backing from the SoPHE Steering Committee and IWG respectively.

The event was attended by more than 20 people ranging from recent graduates to more established engineers and included representatives from a wide range of companies. The golfing skills from the industry’s newest members were on show whilst refreshments were served. It was a great success and lots of positive feedback was received.

Andrews CPD

On 14th of June, SOPHE YEN had the first series of CPDs aimed at students, graduates and less experienced Public Health engineers with Andrews Water Heaters. This was hosted by Paul Marsden at Tattershall Castle with a technical presentation as follows:

- Types of Hot Water Generation Systems
- System Separation and Decentralisation
- Emissions, efficiencies and running costs
- Condensing direct gas fired water heaters and principles of design
- Water Heater and System sizing
- Q&A

Doors opened at 17:30 and had a 18:15 start with the technical presentation set to end at around 19:30. The presentation was followed with refreshments and the chance to socialise with other members of the SoPHE YEN group.

Andrews Water Heaters had a raffle at the end of their presentation and gave away some technical literature. No surprises that the SOPHE YEN Chair, Ruth Howlett, walked away with a winning ticket.

NSF-WRc

On 5th of July, the Young Engineers Network embarked on a long trip to the NSF-WRc factory located north of Cardiff, Wales. Once again there was a good attendance, despite the journey taking over 3 hours from London’s Victoria Station by bus.

NSF-WRc is a test laboratory for water fittings and materials and carries out

testing to assess the mechanical and hygienic properties of products. Many approval schemes recognise NSF-WRc and test reports and results are accepted by certification and approval bodies worldwide.

The group had the chance to walk around the testing facility and learn about the various different tests that each specific product has to go through before being certified. Young Engineers were able to gain some insight as to how the testing facility deals with the variety of products, parts and assesses the impact of the different engineering solutions on product functionality.

During the day Gareth Mapp, Paul Taylor and Thomas Jenkins gave presentations on testing specific products, the direction NSF are moving towards and what challenges they face.

Regardless of how early it was to get up or how late arrival home was, the young engineers made it another successful event with just under 20 attendees.

Image: Tony Hill

Studor Test Tower

On 17th August, SoPHE YEN were given the chance to attend the world's tallest drainage test tower, courtesy of Studor.

A small group of engineers made their way to Northampton where Studor have set up the world's tallest drainage testing facility to demonstrate the importance of a well ventilated system.

With the ability to show the effects of various loads on a system in primary and secondary ventilated instances, the group witnessed how good (and bad!) ventilation strategies can have a dramatic effect on a drainage system and what measures can be taken to ensure a robust design. It also gave a chance to see the Studor P.A.P.A device in action and how it can be used to good effect in problem systems.

Tony Hill of Studor presented the live air pressure data to the group, taken across a number of sensors on the system, so they could see the fluctuations under load and how too much negative and positive pressure can cause problems in drainage systems.

The event received some great feedback, including a comment that "it is a must for all public health engineers to attend"!

The launch of the network has been very well received and has gained overwhelming support from SoPHE, members of the IWG, manufacturers and young engineers alike.

Since the launch manufacturers have been competing to be the next to hold a SoPHE YEN event, realising that the group is a key way to get their products and experience across to new engineers and recent graduates. Equally, events have been well attended by recent graduates, new engineers and those more experienced but with less public health knowledge, with many events selling out early.

With positive feedback received from SoPHE, IWG, event sponsors and attendees, the group is looking to increase the number of events it holds next year, including a mix of live site visits, CPDs, educational factory visits and networking events. Due to the success we are also looking to expand to the regions, with further growth of the south west and northern network and setting up more regions outside of London.

If you are interested in helping to set up a SoPHE YEN network or get further information on a network in your area please feel free to contact a member of the committee:

Ruth Howlett (Chair)

Ben Goodfellow (Vice Chair/Secretary)

Anna Cesenni (Treasurer)

Paria Moghaddar (Education Officer)

Dave Honey (Chief Communication Officer)

Eric Nascimento (Communication Officer)

The network was also set up with the help of James Day as Chief Education Officer. James stepped down from his role in August and the committee would like to thank him for his help in setting up the group and his continued support.

> The launch of the network has been very well received and has gained overwhelming support from SoPHE, members of the IWG, manufacturers and young engineers alike.

Education Group update 2016

Pete White provides an update on what can be expected from the Education Group in 2017.

> I believe that as the Young Engineers have most recently completed the training process, they are best placed to help us understand what could be done better.

As most of you will already know by now, Ian Fellingham stepped down from the group earlier this year and I have now taken over as the Group Lead. I have been a member of the group for a number of years during which time Ian steered the development of the Greenwich University Public Health degree and the Young Engineers Awards. Both of these initiatives have undoubtedly helped to raise the profile of Public Health Engineering within the building services sector.

Late last year we restructured the group to form distinct initiatives to drive the development of three key areas; the Young Engineers Awards, Technical Training and Academic Development. Here's a quick snapshot of the sub-groups activities:

After successfully pairing up with WaterAid to run the Young Engineers Awards for some years, we are now planning on refreshing the Awards with a new charity and the introduction of a research focussed bursary.

Previously, I led the Technical Training initiative. We have started to develop a competency framework to provide young engineers and their mentors a structure for their training in the absence of formal learning. Our next task is to identify existing short training courses that will complement the framework, such as those offered by CIBSE and the manufacturers in our Industrial Associates Group.

The Academic Development sub-group has identified the various universities and colleges offering elements of Public Health learning within their existing building services courses. Our aim is to review the extent to which Public Health is covered within these curriculums, with the outlook to encourage greater focus and develop the quality of current Public Health teaching.

Over the next few months, my aim is to encourage closer working relationships with the other the SoPHE groups, especially the Young Engineers. I believe that as the Young Engineers have most recently completed the training process, they are best placed to help us understand what could be done better.

If anyone is interested in joining the Education Group to help support one of our initiatives, please get in touch – **peterwhitenet@gmail.com**

Thinking outside the box

Heat networks are an increasingly popular solution for multi-dwelling developments – a trend which is set to continue as new government funding comes into play. But for building services engineers, what are the key considerations when designing a system? **Ian Robinson**, technical manager of Heatrae Sadia – special applications, takes a look.

When seeking to specify a heating system for a multi-dwelling development, heat networks are becoming the preferred option, thanks to their reduced whole life costs coupled with simplified installation and maintenance requirements when compared to fitting individual gas boilers in each apartment or going all out electric.

At the same time, the incorporation of low carbon or renewable technologies such as biomass, solar thermal water heating, heat pumps or combined heat and power (CHP) can become simpler and more cost-effective. The diverse thermal loads offered by multi-occupancy commercial buildings presents an attractive demand profile against which such technologies can be operated to maximise the benefits, helping designers and specifiers to meet carbon reduction targets.

So, what are the key points to consider when designing a heat network? As they can range from a couple of flats running off a central heat source to larger district heating systems that feed thousands of consumers, it is important to note that there is no blanket solution. In all cases, however, it is essential that the system is designed as a whole, rather than looking at the separate elements in isolation.

The success of a heat network largely lies in it being sized and designed appropriately for the demand of the building, and that time has been taken to understand both the peak and base loads.

When looking at peak loads it is critical to apply an appropriate coincidence factor to take account of the diversified hot water demand and space heating loads. When looking at how the system will cope with the base load, it is important that as much system turn down is built into the design as is feasibly possible.

There has been confusion in the industry as to how to calculate the diversity of the system. While the latest UK guidance (BS EN 806 and BS8558) for sizing hot water loads can lead to oversizing, the Danish standard (DS439) offers a different solution to calculating diversity and is being adopted throughout the industry. It is understood that using DS439 leads to significant reductions in the size of the central plant and heat network, especially in larger developments. In fact, for large multi-residence developments, the hot water usage coincidence factor is often well into single figure percentages.

However, even codes like the DS439 are not a blanket solution. The designer must establish who will be using the building and what the likely tapping patterns are, and then establish what the likely impact will be on the system as a whole.

Consultants should be aware that building in a little extra 'for luck' can result in damaging consequences in the long run. If oversized, it won't just be the boilers that are too large – inevitably elements such as the pipework, distribution pumps, expansion vessels and inhibitor volumes required to protect the system, to name just a few, will increase, to the detriment of the system. For instance, greater diameter pipework leads to higher heat losses resulting from the larger surface area of the pipework. Communal areas including corridors and foyers often fall victim to overheating caused by such heat losses, and so effective insulation of the distribution network is a must.

> When looking at how the system will cope with the base load, it is important that as much system turn down is built into the design as is feasibly possible.

At the same time, the performance of an oversized system can be compromised because of its limited ability to modulate down in line with the daily and seasonal load profiles. As mentioned above, it is important that a strategy to cope with the base loads is built into the system. Sharing the peak load across more boiler modules is one way of doing this, but consideration must be given to how quickly the boilers can ramp up and down to meet fluctuating system demands.

For a more responsive system, designers should consider making the system more flexible by incorporating thermal storage or a buffer vessel. By enabling the boiler to feed into the buffer vessel, any delay in the boilers responding to the changing demands of the system can be accommodated, leaving the more agile pumps to ramp up and down quickly and efficiently. Without either, the boiler will have to work in tandem with the pumps, which can be challenging and result in an overall loss of performance. An additional option is to incorporate a much smaller jockey pump to support the main pumps, allowing the system to run more effectively when demand is very low.

Careful consideration needs to be given to the protection of the distribution network pumps in low demand conditions. It is also worth noting that when using instantaneous hot water HIUs there must always be a flow of primary water around the system capable of delivering heat and inhibitor treated water to every extremity of the building. To achieve this, it is good practice to install a bypass (constant flow valve) at the end of each branch, which should be collectively sized to protect the pumps or jockey pump (if fitted) at the minimum duty point.

The bypass valve's function must not be confused with the hot water pre-heat system in the HIU. Designers shouldn't rely on the HIU pre-heat system to protect the distribution pumps in low flow conditions. There are a number of reasons for this; one being that of demarcation. The HIU is likely to be within the apartment and under the control and ownership of the end user who may wish to isolate the unit from the network, especially if they intend to leave the apartment unoccupied for any length of time. Another reason is that the HIU pre-heat system is designed to keep the primary flow pipework charged with heat. Most HIUs do this using either thermostatic or electronic control and in a system with low heat losses this will mean intermittent operation of this function.

> For a more responsive system, designers should consider making the system more flexible by incorporating thermal storage or a buffer vessel. By enabling the boiler to feed into the buffer vessel, any delay in the boilers responding to the changing demands of the system can be accommodated, leaving the more agile pumps to ramp up and down quickly and efficiently.

When choosing an HIU, specifiers should consider models which offer a proportional integral derivative (PID) controller linked to a 2 port modulating pressure independent control valve (PICV). This will control the flow of primary water through the HIU, maintaining the flow irrespective of the dynamic pump pressure, which can experience some lag time as dwellings come on and offline for heat.

Models like the Hi-Max Instant ID from Heatrae Sadia use electronic PID controls to monitor and regulate both flow and return temperatures, thus giving greater control over the system as a whole and whilst offering a multitude of additional intelligent features.

Heatrae Sadia's Special Applications Team is experienced in providing expert support at the design stage of schemes both large and small, and its Hi-Max Instant ID carries the NEMKO N mark and is approved by KIWA.

For more information 01603 420 220 or visit www.heatraesadia.com.

Issued on behalf of Heatrae Sadia by Bright, 5 Highfield Road, Edgbaston, Birmingham B15 3ED. For further information please contact Ruth Barrows/Anna Jamson/Beth Dunmore at Bright on Tel: +44 (0) 121 456 5600 Fax: +44 (0) 121 456 6040 or Email: ruth.barrows@bright-pr.co.uk.

Taking the heat out of cold water design

Overheating in cold water systems is increasingly becoming widespread. Aecom's **Richard Beattie, Damien Kane** and **Steve Vaughan**, all MCIBSE, look at the causes and offer design and operational guidance based on their experiences.

Maintaining water movement within a cold water system prevents overheating and helps to maintain a healthy, hygienic system. Stagnation exacerbates overheating and may contribute to contamination by micro-organisms. Recent sustainability initiatives – aimed at reducing water usage by encouraging devices such as flow limiters, spray and percussion taps, and low flow appliances – have reduced peak water demands in buildings, and so cut flow rates.

To promote movement of cold water within systems, there has been a recent move towards adopting strategies that were not traditionally incorporated into cold water pipework design, such as a secondary cold water return circuit and end-of-line solenoid flush (dump) valves.

These are an added expense and contribute to wasted water and/or energy, so should be considered carefully when incorporating them into domestic cold water systems (DCWS), taking into account other contributory factors such as: the building water usage and turnover; higher building airtightness standards coupled with smaller service voids, meaning more potential for overheating; and sanitaryware specification.

Potential mitigation measures include:

- Introducing a cold water return circuit, combined with automatic balancing valves, to maintain water movement within the system
- Installing automatic dump valves at the system extremities/sentinel points
- Installing a refrigeration system with pumps and a plate heat exchanger to chill water within the cold water storage tanks, to ensure that the water is stored at an appropriate temperature – or connect to a building chilled water circuit if one is available

Overheating

Increasingly, temperatures greater than 20°C are being recorded, thereby exceeding the maximum temperature for cold water systems, as recommended by HSE L81. In several instances it has proven difficult to achieve temperatures of less than 20°C because of the temperature of the incoming mains water supply and absorbed ambient heat. Several potential factors may contribute to overheating of DCWS (see panel, above). Relatively straightforward measures can alleviate the risk of overheating – or at least indicate where further investigation could be beneficial. As well as design recommendations (see panel right), effective commissioning, monitoring and maintenance is needed.

Potential alleviation measures

DCWS and low temperature hot water (LTHW) systems must be commissioned appropriately and then monitored, to ensure heating set points and time schedules are set properly, and DCWS are maintained at safe temperatures. Seasonal commissioning should be included in the contract to allow systems to be adapted to seasonal variations and changes in user need. Site supervision and quality control procedures must include thermal insulation of pipes, valves, flexible pipe connections and relevant heat-emitting equipment, such as LTHW radiant panels.

A 'soft landings' approach should ideally be in place to help users and operators understand the building and the associated systems' design intent and operation. Appropriate controls and sensors should be installed to monitor domestic cold-water consumption and cold-water temperatures in the system. Clients should be encouraged to carry out post-occupancy evaluation to learn how systems are performing. Building operators should log data, which can be used to inform standards and guidance updates.

Once the system is operational, implement an appropriate management strategy, which includes manual flushing of mains and coldwater pipework to all remote outlets on a daily routine, and identifying infrequently used outlets to be included in the flushing regime.

The facilities management team needs to be provided with sufficient training and background information relating to the running and operation of the DCWS systems. The benefits of seasonal commissioning and soft landings should also be explained.

Developing standards

Promoting a culture of collaboration and knowledge sharing should be an objective for all. As such, industry experience and academic research should be harmonised. There should also be a review of standards relating to the design and sizing of cold-water systems, drawing on the experience of industry professionals and available live data across a range of buildings and sectors.

Flexible pipes are easier to install but could potentially harbour bacteria

The issues raised in this article have accumulated through several resources and do not reflect any specific project or Aecom design. The issues and mitigation measures have been compiled from the experiences of multiple engineers, from many consultancies, over several years.

Reasons for overheating

From the mains water supply network
A rural location of a building on a radial service; water temperatures can increase because of the distribution routes from the reservoir/pumping station and potential low rates of water draw-offs

In older buildings, the incoming mains water pipeline from the site boundary to the cold water tank room can be at a shallower burial depth

Water storage tanks located above ground or in semi-buried configurations From water conservation measures

The introduction of rainwater/greywater/blackwater recycling for water conservation

Use of percussion taps and low-flow fittings

A lack of regular flushing of the system as a management procedure

From higher void temperatures
Increase in the amount of building insulation and a higher level of airtightness raises the temperature around the pipework

Centralised plant can introduce additional heat-emitting mechanical/public healthrelated services in the voids that are common with the DCWS pipework

Reduced periods of occupancy.

From design and management
A lack of temperature monitoring within the cold water tank, incoming mains and at the extremities of cold water pipe distribution

Oversizing the cold water storage volume

Reduced periods of occupancy and demand, such as at weekends and holidays

Heat-generating plant and equipment within ceiling voids

DCWS pipelines should be kept a minimum distance/orientation from any hot water and LTHW heating pipelines within void spaces

If the plantroom where the cold water storage tanks are located is unventilated, there may be the potential for cold water storage temperatures to increase when there are periods of low usage

A lack of quality control or legislation, particularly with thermal insulation of plant and equipment

Insufficient separation between the heatgenerating plant and equipment

If occupancy levels after handover is less thanenvisaged at design stage, a lack of domesticwater draw-off, and infrequently usedoutlets, may raise temperatures

The end user not implementing risk assessments and procedures to control the risk of Legionella.

Design best practice

Ensure pipe sizing is carried out as close as possible to the expected demand to ensure good flow and, to minimise stagnation and potential heat gain

External MWS pipework between the site boundary and plantroom should be at a depth of 750mm

Isolate and drain down one cold-water storage tank section if provided with central division if the total turnover is not as designed. This will improve water turnover to demand

Increase the thickness of insulation on the cold water system pipework

Provide a delayed-action, adjustable-height ball valve in water storage tanks to allow stored volumes to be adjusted

Consider reducing cold water storage levelswithin buildings appropriate to the building type, and anticipate demand (reduce from 24hr to 12hr storage)

The addition of a water treatment system, as described as an alternative to temperature regime in **L8 Approved Code of Practice and Guidance, The control of Legionella Bacteria in Water Systems, to the domestic water services systems.** This solution will assist in eliminating legionella within systems, but will not address the issue of water temperature

Enhance void ventilation movement by introducing high- and low-level grilles to induce airflow through the ceiling voids.

Regional round-up

Thank you to all SoPHE members, including our Technical, Industry and Contractors group members for their continued support for the various regional groups.

Malcolm Atherton,
SoPHE North
Email: m.atherton@dssr.co.uk

Jassim Daureeawo,
SoPHE London
Email: jassim.daureeawo
@vortex.uk.com

Rachel Porter
SoPHE East Anglia
Email: rachaelporter@
hoarelea.com

Andrew Russell,
SoPHE UAE
Email: Andrew.Russell@
wspgroup.com

Piotr Lisiewicz,
SoPHE Oxford & Midlands
Email: plisiewicz@
foremanroberts.com

Christian Armentia,
SoPHE South West
Email: Christian.Armentialniguez
@arup.com

SoPHE North

The 6th – yes, the 6th (!!) – Northern Dinner of the Society took place, once again at the Midland Hotel Manchester, on Friday 6th May 2016.

Due to the success of last year's Dinner in which we had over 120 people seated within a room which holds a maximum of 120, a "management decision" was taken to hold the Dinner in a larger function room – the Trafford Suite, situated on the ground floor of the hotel. As always, proceedings began at 6.00pm with pre-dinner drinks; colleagues & guests alike were able to mingle and meet-up with both "old" and new friends prior to being called to Dinner itself at about 6.50pm.

Once again, our Toastmaster for the evening – Dave Greenall – kept everyone to order throughout the whole of the evenings proceedings with the efficiency of a military man!! All 117 attendees, ranging from different aspects of the industry, made their way to their respective tables – after having checked which table name they were seated.

As in previous year's whereby each table is given an unusual name, it again "fell" to Natalie Harrison (a Senior Public Health Engineer based in Manchester) to provide this year's! They ranged from "Wringley's Gum", "Raspberry Tart", "Jeremy Kyle's" and ended with "Richard the Third"!!!

Once everyone was seated / settled, out Toastmaster invited SoPHE Chairman Steve Vaughan to begin the evening with his opening speech; he thanked everyone for attending as well as thanking the respective table sponsors. Steve explained to the audience the exciting and challenging work that the Society has been doing over the last 12 months, reminding everyone that those that are involved in the workings of the Society are all volunteers!

Everyone then had a very enjoyable 4-course meal which culminated in the Royal Toast ("The Queen & the Duke of Lancaster") followed shortly afterwards by the main event of the evening – our Guest Speaker, Dave Wolfe.

Dave made his television debut in 1979 on LWT's "Search for a Star", and went on to win the final, beginning 1980 with his own television special. He has worked extensively in television, radio, theatre, cabaret and conferences; character assassination is a speciality of Dave's. However, he is well aware that it is his job to entertain and not to offend, and to that end he is always politically sensitive (in fact, he says that the only people whoever complain are the ones that thought they should have got a mention and didn't!!).

As you may have guessed, the table names are various slang words to which the competition for the evening was to identify what each of these meant?! Due to everyone (!!!) using their mobile phones to google the answers, it was necessary to have a 'tie-break' question to which a representative from each table was asked – "When did the first Northern Dinner take place & how many attended?" By sheer fluke, the VIP table got it right!!!!!

Mike Darvill, SoPHE Industrial Associate Chairman then thanked everyone for attending; he thanked the respective table sponsors personally for supporting the evening by naming each one to the audience.

SoPHE would once again like to take this opportunity to thank all the table sponsors for their support towards the evening; without them, the evening would not happen. Also, thanks to everyone who attended this 6th Northern Dinner and, by doing so, supports the aims & objectives of the Society. There are so many dedicated individuals who support the Society in many different ways and without their hard work & efforts, events such as this wouldn't be possible. In particular, a very large "thank you" – which is well deserved – must go to Malcolm Atherton, Steve Ingle, Natalie Harrison, Mike Darvill, Alan Flight and Peter Hardiman.

This year's Dinner has been so successful especially in terms of the numbers attending that the next one – the 7th Northern Dinner – will take place on Friday 5th May 2017. It will again be held in the Trafford Suite so, watch this space and we will keep you updated with the progress of organising next year, as well as providing further details nearer the time.

The organisation committee welcomes any suggestions / ideas with regards to a Guest Speaker for the evening, as well as any other ideas. Can you provide some unusual table names for next year? Is there a competition idea you have, relating to Public Health, that we could orchestrate??

The dinner was well attended and once again guests were treated to some unusual table names

SoPHE London

The Technical Committee has defined new objectives and initiatives to provide better support to our growing number of members, in view to promote knowledge sharing.

Some key initiatives and objectives are:

Publication of Technical Bulletins
The society wants to promote the issue of Technical Bulletins (TBs) on key topics, to be made freely available to its members. One of the aims of these bulletins, is to provide guidance and recommendation on best design practice, where there are no regulations, standards and design guides available. The society is aiming to publish a number of these bulletins on relevant Topics to assist members.

The first TB to be released will be based a very interesting subject ; " Domestic Water Demand Assessment for Pipe Sizing " , which aligns with the current research being undertaken by a number of stakeholders within our industry, to review the load assessment Methodologies for pipe sizing, under the "Loading Unit Normalisation Assessment" project , Commonly known as the "LUNA project".

SoPHE Technical Trips
The London Technical committee (LTC) is aiming to organise two technical trips per year for the SoPHE Members. CPD certificates will be issued for each trip based on technical content of the relevant trips.

The first technical trip organised by the LTC this year was, a trip to Germany to visit a Water Treatment Manufacturing plant, sponsored by one of our Industry Working Group members, Hydrotec. This gave the participants a much better insight on the various manufacturing processes involved during the manufacturing and testing of water treatment equipment.

Technical Reviews relating to Public Heath Engineering

- SoPHE will strengthen its relationship with other professional institutions, to ensure that we have the opportunity to contribute and review draft standards, and other relevant publications.
- Promote online seminars and discussion
- SoPHE will encourage discussion on LinkedIn and organise webinars.
- This initiative will be beneficial to members, specially those who would wish to attend specific seminars but are unable due to their locations.

For suggestions on future CPD events, please send your enquiries to: **events@sophe.co.uk.**

For technical related enquiries and suggestions on future technical bulletins, please email us at: **technical@sophe.co.uk**

SoPHE East Anglia

We have quite a few things happening over the coming months and with lots more in the pipeline.

We've just hosted a successful Thermal Balancing CPD event with Oventrop Ltd.

We are in the midst of organising a Christmas event in conjunction with Danny Stackhouse from Heatrae Sadia and Cheryl Louis-Taylor from Hydrotec. Dates and venue will be sent out soon.

Rinnai are primed for a January CPD event and we're looking at February for another CPD event with Building Products Distributors Ltd.

We're also looking at strengthening ties with a range of companies, such as Veolia and Stokvis, who we hope will apply to the Industrial Associates list for SoPHE. They have recently run a number of non-CIBSE accredited CPD programmes, which have been both technical and beneficial and it will be great to have them on board and share their expertise.

A number of other CPD events are in the planning stages and we hope to have a number of them in the diary early in the new year.

Th SoPHE Oxford CPD lunch was a great success

SoPHE Oxford & Midlands

SoPHE Oxford CPD's lunch took place on the 28th of September with Steve Vaughan CIBSE SoPHE Chairman and main speaker Craig Bond of ACO Building Services.

Steve kindly offered his assistance to chair the first seminar which was well received and provided the introduction and summary of the SoPHE achievements over the last period of time, main goals and plan of action for the nearest future as well as invited everyone to join the forum and knowledge network within the region.

Craig Bond of ACO Building Services presented on Hygienic drainage for food processing applications and provided an overview of the most current building regulations requirements covering the food processing systems, explain the common industry terms including risk categories and their implications on drainage system as well as different drainage system configurations for selected risk areas. Craig also explained the examples and main 'watch points' of drainage design strategies where bacteria and pathogens were found in the food processing and kitchen areas. In the summary he covered the recommended material selection using austenitic stainless steel with explanation of post-fabrication finishing processes important for durability and long life of a product.

SoPHE South West

After recently being handed the role of SoPHE Sout West representative from Andrea Bertoneri; it is my intention to carry on the good momentum he has brought to the region.

We will be hosting one technical evening every 2 to 3 months delivered by regional engineers focusing on sustainable cities, resilience to the consequences of climate change and general context of the Region (we need to understand our region to deliver good public health infrastructure).

SoPHE Australia and UAE

Early October saw the start of the plans to form a SoPHE group here in the region with a formal launch planned for February 2017. Currently membership is very low and this is a key focus area before the formal launch.

However the region is enjoying a buoyant construction period currently with significant investment in all areas especially as Dubai prepares for Expo 2020 and Qatar prepares for the World Cup in 2022.

The formal launch date was chosen to allow the new SoPHE representatives in the region to spread the good word about SoPHE to all the engineers in the Middle East. This is needed to raise awareness of the group, the importance of being a member and the profile of public health engineering in the Middle East.

As the public health engineers here in the region come from such a wide and diverse background in terms of culture and education we see training as a key activity to be driven by SoPHE in the region. The region suffers from a wide ranging set of regulations whether local, UK or International and the issue of Technical Bulletins to suit the design practices in the region will be greatly appreciated.

The key focus areas highlighted by the SoPHE representatives in preparation for the launch and the next 12 months will be to engage with local manufacturers to provide support to the group with a schedule of technical seminars and CPD/Training to be developed to suit the region.

Dates for your diary

February

What's on:
SoPHE CPD & Quiz Evening.
Oventrop
Region:
SoPHE Oxford
Where:
The Grain and Hop Store (1st Floor), Cambridge
When:
23rd February

March

What's on:
SoPHE Northern Technical Evening
High Performance Buildings
Grundfos.
Region:
SoPHE North
Where:
Rainbar, Manchester
When:
15th March

Join the conversation

Why not join in the conversation on Twitter? You can ask questions, point people towards something interesting, share photos and keep up to date with the latest news, events, awards and industry chat.

You can also go online to the CIBSE website to find all you need to know about SoPHE.

Contributions

We would welcome any contributions to future editions, please let us know us about:

Future events

Items or comments you think may be worth raising or informing your fellow members.

Technical articles from members, giving situations encountered and how they were overcome.

Email: info@sophe.co.uk

Feedback

We're always open to suggestions about how we can make this publication better for our members. Please share your opinions and ideas about what we should be providing to our members.

Email: info@sophe.co.uk

Sponsorship

If you are interested in sponsoring one of our feature articles, please get in touch with us.

Email: info@sophe.co.uk

Social

The SoPHE LinkedIn group is an ideal platform to reach out to your SoPHE colleagues to discuss new technologies, raise technical queries and keep up to date with whats going on with SoPHE in your region. You can also follow the latest updates on Twitter @The_SoPHE

Contact SoPHE

Telephone: +44 (0)20 8675 5211
Email: sophe@cibse.org

Find out more at www.cibse.org