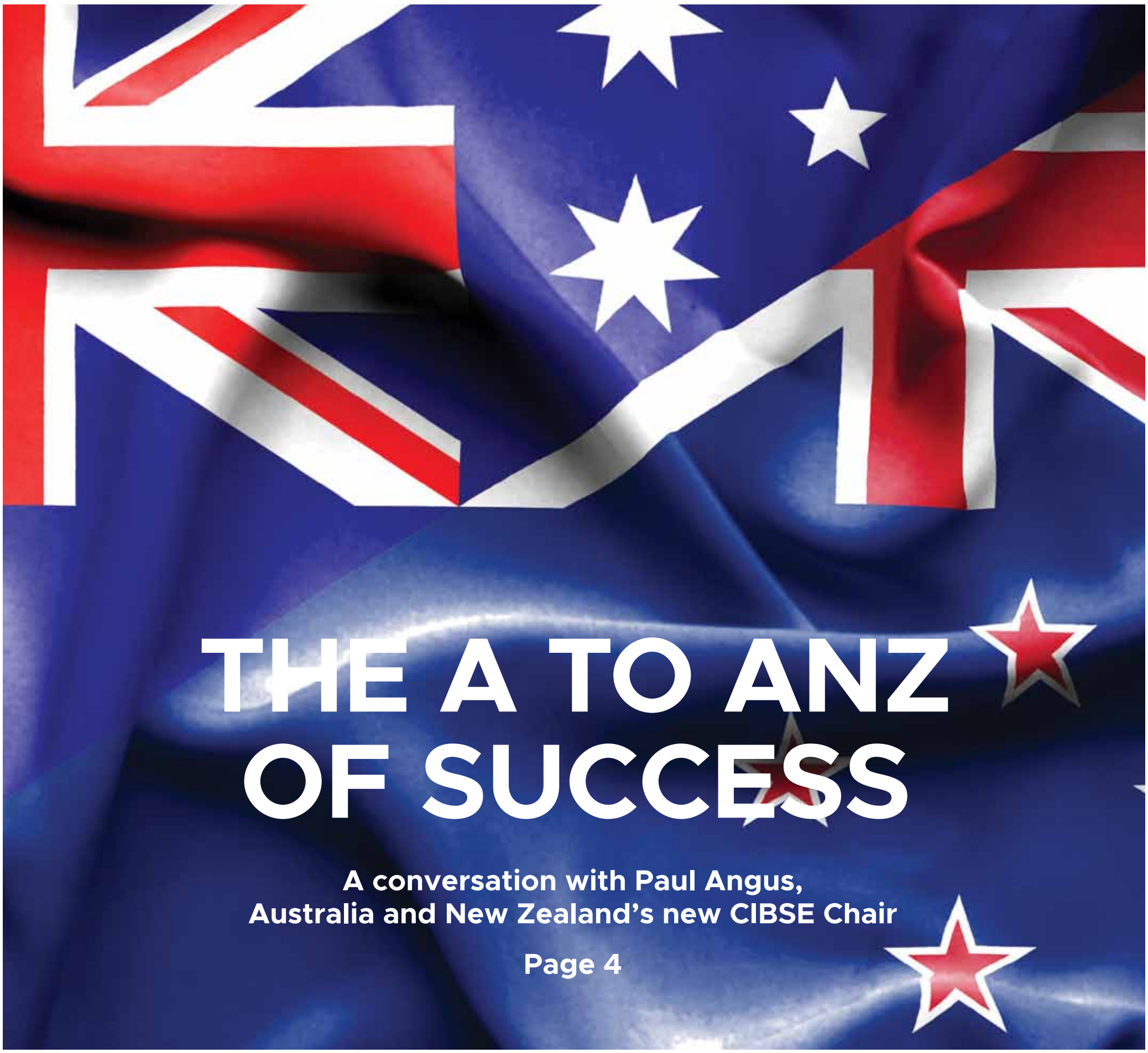
SoPHE
JOURNAL

Volume 15 | The Quarterly update from The Society of Public Health Engineers | Issue 5



THE A TO ANZ OF SUCCESS

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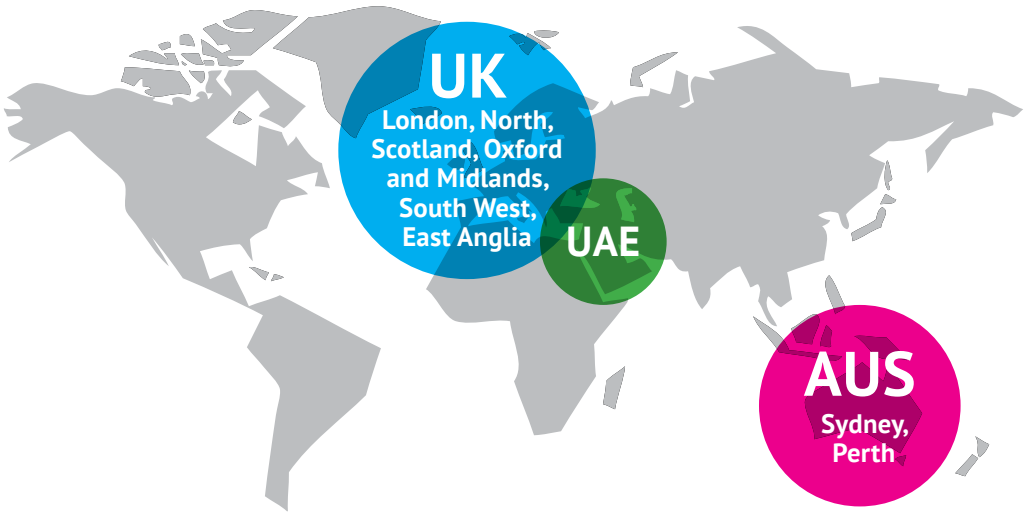
Plus the Latest News, WRAS update, Technical Perspective, Regional Round-Ups and forthcoming events

The SoPHE network

SoPHE is an international organisation that aims to provide a higher profile and focus for public health engineers within The 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

It is with sadness that we must begin by reporting the recent passing of two key figures within the Public Health Industry: Dr. Steve Tuckwell and Dr. Steve Ingle. Both were well respected and hugely influential across both our industry and the Society. Our thoughts and condolences go out to their families, friends and colleagues.

The annual SoPHE Northern Dinner was another huge success with manufacturers, engineers, contractors and a few spare mechanical engineers coming together for fun, food and laughs. This year's guest speaker was Ian Robertson, the BBC Rugby commentator who entertained the guests with his wit and incredibe array of anecdotes from his 40 years of broadcasting.

Peter White offers an update on the progress made by the Educational Group and how we are aiming to increase the Public Health discipline within universities and courses going forward. We also catch up with Paul Angus, who shares his journey from plumbing apprentice in Aberdeen to becoming Australia and New Zealand's 16th CIBSE Chair.

WRAS provide some insight to commercial backflow prevention and our technical perspective focuses on cold water tanks.

With schools breaking up, Wimbledon over for another year and most of the country bathed in sunshine, it's safe to say the holiday season is well and truly here.

So, it only remains for us to wish you all a very happy, fun-filled summer.

Regards,

The SoPHE Editorial Team.

Thankyou Linda

Linda Dulieu has recently stepped down from her role as our Honorary Secretary where she has made a huge contribution to the continued success of the Society. At the AGM, Linda commented: “Thank you for the thoughtful gift that was presented to me on the evening, on the occasion of my retirement from the Steering Committee. I can’t believe that I served for four years!”

Steve Vaughan presented Linda with a glass bowl, complete with candle. “It looks lovely in the lounge. It can also be used as a vase if ever I get a massive bouquet of flowers!”

Linda’s role has been taken on by Rory Edwards, whom we wish every success in his new post.

British Standards

A number of British Standards have been released over the last couple of months which you may wish to familiarise yourself with, including:

BS 8614 Water meters Additional requirements for meters with polymer main casings

BS ISO 20426 Guidelines for health risk assessment and management for non-potable water .

Water hygeine talk

Steve Vaughan has been invited to represent SoPHE at the H&V News Indoor Air Quality & Water Safety conference at Villa Park, Birmingham on September 14th and 15th.

Steve will be discussing water hygiene in particular how to prevent water hygiene problems being designed into buildings from day one: 360 degree view.

The Water Management Society

The WMSoc Conference will be held on November 15th 2017 at SCI, Lodon, SW1X 8PS. The conference will be specific to designing out HIAs including Legionella, Pseudomonas, Mycobacteria etc.

Who Should Attend?
Anyone with a direct or indirect interest in designing, installing, maintaining or looking after healthcare premises water systems and the products connected to them. This includes architects, contractors, plumbers, manufacturers, hospital engineers, estates staff, infection control staff, microbiologists and any other members of water-safety groups.

Education Group update

Pete White provides an update on what’s been happening and what’s coming up for our Education Group.

The restructured Education Group is now up and running with meetings having taken place in February and May. At each meeting, we have concentrated on one area of our agenda, which is broken down into three key areas; the Young Engineers Awards, Technical Training and Academic Development. The following is a quick overview of the sub-groups progress so far, this year.

In February, we concentrated on the Young Engineers award, as this has a series of deadlines to meet to get the advertisements out in time. Ed Clarke leads this section and presented a series of possible challenges that he had developed with our new partner charity – Engineers Without Borders. One challenge in particular stood out, because it introduced the possibility of entrants working with some of our Industrial Associates on prototype components. Also, input from the Young Engineers Group has led us to update how initial entries are presented, with the inclusion of a short video as an alternative to the traditional poster. So it will be interesting to see what this generates.

For our second meeting, in May, Mike Best explained how the Hoare Lea Public Health competency framework operates. Hoare Lea have kindly allowed SoPHE to develop a generic version of their framework, which when completed will be available to all SoPHE members. A significant feature of this framework is the availability of suitable mentors to review the progress of trainees using the scheme and ensure proper SoPHE oversight. From our discussions, it was clear that this needed further consideration and would be the topic of a future meeting.

Last, but not least, the Academic Development sub-group is led by Lynne Jack and she will be updating us on any developments in Public Health learning in colleges and universities, when we meet in September. 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.

As always, if any of you are interested in joining the Education Group to help support one of our initiatives, please get in touch with me at - peterwhite@phdc.co.uk

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CIBSE

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This edition has been produced in association with Roth

A word from the Chair

In this edition **Steve Vaughan** talks about new regions and jet lag, the SoPHE Bursary and how the society is working to inspire the public health engineers of the future.

Hello and welcome. I hope this edition of the Journal finds you well and looking forward to the summer! As always the society steering group members and supporters have been working hard since the last journal; for example the first SoPHE technical bulletin (STB 16-01) was issued at the end of 2017 and was very well received by our industry. The London Technical Committee are now planning the next bulletin which will address Rainfall Intensity design principles.

We've also been progressing with plans to strengthen collaboration with other likeminded institutions and have set up a separate working group to provide clear direction on our aims. In addition to several other institutes and societies our most recent discussions have been with the Water Management Society (WMSoc) and we have already identified several similarities that will provide mutual benefit to both societies.

From the outset, the Contractors Group have been keen to concentrate on improving plumbing installation standards and training. With Sanjay Modasia and Linda Dulieu attending an inspiration day at a local technical college, the Contractors Group plan to continue to develop links with technical colleges with the intention of increasing student awareness of public health engineering as well as additional technical support. This focus also leads nicely onto our long term plans to set up a SoPHE Bursary which was instigated by Honorary Fellow Mr Chistopher Sneath's kind offer of an annual donation to support SoPHE in this way. Although early days, progress is very encouraging and with further support from our Industrial Associates I'm sure this will be a success in a similar way to the Young Engineers Award which has become highly recognised in the industry.

Also inspiring has been the continued passion of the SoPHE Young Engineers Committee with various events being held including DESIGN INSIGHT talks where senior engineers present on topics of interest to pass on their experience to younger engineers.

Other exciting news is that we have recently formed 2 new regions. The United Arab Emirates region was launched in March and Midlands region in June. I was lucky enough to attend both inaugural events which were both a great success, even if the thought of jet lag made me think twice about traveling to the UAE! A special thanks must go to Andy Russell in Abu Dhabi and Rod Green in Birmingham for making this happen, as well as the local members who have also provided valuable support. So where to next, Hong Kong and maybe India?

Further exotic travel on behalf of the society included attending the Northern dinner (Manchester) in May. As always a superb event with a record attendance at the Midland Hotel which Malcolm Atherton runs with military precision.

June saw the AGM take place, a formal affair with all current officers being nominated and restanding there with just one, but no less significant change to the steering Group. Linda Dulieu completed a 3 year term as Honorary Secretary and handed over the scribe to Rory Edwards. It's been such a pleasure to have Linda on the steering committee and I look forward to finding another no less important role for her within the society! It's also great to see that Rory has stepped up to the challenge and issue the AGM minutes within 1 week!

The annual dinner back in November was, as always a triumph. It was also a great honour for me to deliver the opening address to such a warm and welcoming audience and a pleasure to see familiar faces as well as many new members which signifies how well the society is growing. We were also pleased to be able to introduce our new charity partner at the dinner, Engineers Without Borders, with the Industry Associates making a generous charity donation on the evening as well as Ed Clark presenting the Young Engineers Award to well-deserved winners as well as a highly commended award.

Unfortunately I do also have to report on sad news with the loss of two significant figures within the Public Health Engineering community. Steve Tuckwell sadly passed away in March with Dr Steve Ingle regrettably also losing his long battle with ill health in June this year. Both will be dearly missed within our society.

Dr Ingle had held the post as CIPHE President and was active in many industry initiatives during his career as both an engineer and lecturer. He was a strong supporter of young engineers who were looking to progress within our industry. As many of you will know, Steve Ingle was quite a character but also very kind hearted. It was during the planning of the SoPHE 2015 London Drainage Conference that I got to know Dr.Ingle, without his passion and commitment it would have not been possible to hold such a successful conference which mirrored an earlier event that Steve had organised in Manchester the previous year.

Steve Tuckwell was also a very well-respected figurehead within the PHE community; best known by SoPHE for providing regular technical articles on behalf of WRAS in the society journal for many years. It was back in November 2015 that I first met Steve Tuckwell as I invited him to attend the SoPHE Annual Dinner as my VIP guest. Even during this short time I found Steve to be a very humble man and a true gent. Both gentlemen will be dearly missed by all who knew them and will no doubt leave a void within the public health engineering community.

In recent months across the UK unfortunately so many people have had to encounter such difficult times due to terrorism, particularly within Manchester and London as well as the dreadful events at Grenfell Tower. These events have led to numerous innocent people losing their lives as well as our emergency services being stretched beyond what many would consider humanly possible.

It is at times like these that I realise how resilient we are within the UK and beyond, whether it be against minority extremists or in the face of a disaster such as Grenfell. It also makes me appreciate how, as engineers we influence and shape the built environment and can have a big impact on people's lives. It's so important to take nothing for granted and strive to help others less fortunate that ourselves. It is already apparent that these challenges are being tackled and changes are being progressed which will affect our daily lives as well as influence our design decisions and standards that many of us will adopt within our professional careers.

Finally, as we break for the summer I would like to thank you for your support and wish you happy holidays and look forward to seeing many of you at future events such as regional CPDs or at the CIBSE Build2Perform LIVE show at Excel in November where we will be exhibiting and presenting several technical forums.

Best regards,

Steve Vaughan
SoPHE Chair

chairman@sophe.co.uk

Industry Working Group & Industrial Associates update

The Industry Working Group continues to grow now with over 65 members including an expanding Contractors Working Group now with 5 members and growing. Sanjay Modasia from J. A. Brooks has been nurturing the Contractors Group for the 2 years and the result is that they are now looking to have there own meetings in the near future. Well done Sanjay.

At our AGM Peter Hardiman from Blucher has retired and we wish him well in his new relaxed life. Peter has been our treasurer for many years and was instrumental in securing the status of our IWG funds with which we continue to support Public Health Engineering.

Tom Byrne who has been assisting Peter Hardiman for the last year has taken over the role of treasurer and we wish him well in his new role on the IWG Committee.

Image: Natalie Oxford

The country has been shocked by the Grenfell Tower fire and the Industry Working Group is donating £1000 to the victims of this tragedy.

On a more positive note the organising of the Annual Dinner has begun and we are looking forward to another celebration of the Public Health Industry whilst raising much needed funds for the SoPHE charities.

Mike Darvill

Appliance compliance

Identifying the right backflow protection

Commercial premises often need higher levels of backflow protection for their water-using appliances, such as dishwashers and washing machines. This article provides advice to help identify the right backflow prevention for these appliances.

Changes afoot

The design, manufacture and installation of appliances if supplied from the public water mains, come under the scope of the Water Supply (Water Fittings) Regulations in England, Wales and Northern Ireland and under the Water Supply (Water Fittings) Byelaws in Scotland, together referred to as 'the regulations'.

These appliances must be:

– Designed and manufactured to be of an appropriate quality and standard;

– Suitable for the circumstances where they are used; and

– Installed so that they comply with the regulations.

In addition to the installer, owner and user's legal duty to comply with the regulations, the licensing of care homes includes a requirement that all relevant legislation must be complied with, which includes the water regulations.

Backflow protection

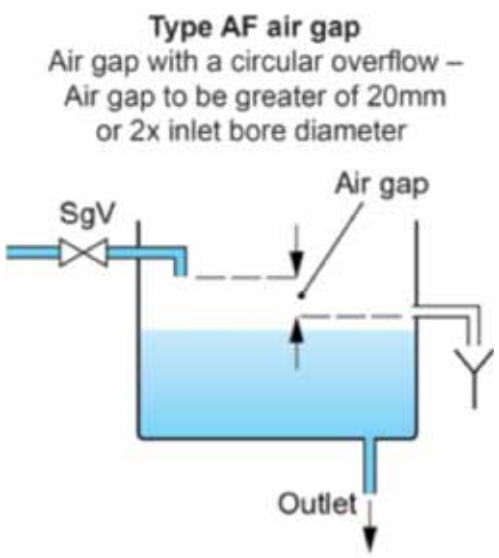
Appliances must have suitable devices to prevent backflow. Backflow risk from the contents of an appliance is assessed using a system of fluid categories – where fluid category 1 represents drinking quality water and fluid category 5 is the most contaminated. In private domestic dwellings, dishwashers and washing machines are rated as fluid category 3. But in commercial premises there is a higher risk from the same appliances and the backflow risk is rated as fluid category 4, or if healthcare is provided in the premises, as fluid category 5.

The regulations require use of a recognised backflow prevention device. Backflow prevention devices are rated by the level of protection for different fluid categories. The device used must give protection at least as stringent as the assessed risk. For example, an appliance with a fluid category 4 backflow risk must have a backflow prevention device or arrangement of fittings which is rated at least fluid category 4.

Some appliances designed for the commercial sector have fluid category 5 backflow protection built in to protect the water inlets and can be installed without additional requirements. 'White goods' intended for the domestic market often do not state what fluid category protection, if any, is inbuilt although some may include fluid category 3 protection.

Where any appliance is used, care needs to be taken to identify the backflow protection requirements and ensure that the appliance has the appropriate protection incorporated within the machine or has appropriate backflow protection installed upstream of the appliance.

Different backflow devices have different protection ratings. For fluid category 4 protection, appliances can be fed via a 'break tank' – a small storage cistern open to atmosphere and containing a Type AF airgap between the inlet and maximum water level. Alternatively a 'reduced pressure zone valve' (RPZ valve – a type BA device) can be used to maintain water pressure from the feed pipe. To provide fluid category 5 protection, only a break tank with a Type AA, AB or AD airgap is adequate.



> Backflow is defined as 'flow within or from a water fitting in a direction opposite to the intended normal direction of flow'. Reversing the flow can draw contaminated water from an appliance into the water supply which may feed other outlets, putting drinking water and health at risk.

Appliance design and manufacture

The installer has the legal duty to ensure that appliances comply with all aspects of the regulations. When inspecting plumbing systems in new and existing premises, water suppliers' regulations enforcement staff may ask for evidence of compliance of fittings. People who specify, purchase or install appliances should ask the supplier or manufacturer to provide evidence to confirm that the appliance has been tested and complies with the UK regulations. One approval readily accepted by water suppliers is operated by the Water Regulations Advisory Scheme (WRAS) – however other methods to demonstrate compliance are available. Manufacturers submit their products for testing and WRAS assesses the results against the performance criteria and awards 'WRAS Approved Product'. Up-to-date lists of Approved Products are freely available on the WRAS website (www.wras.co.uk/directory).

Usually WRAS Approval is accompanied by requirements for how the appliance should be installed - for example, with an external servicing valve or a given type of backflow prevention device. These 'Installation Requirements and Notes' (IRNs) must be complied with for the WRAS Approval to be valid.

Summary

When considering installation of appliances, a risk assessment should be carried out to assess the backflow risk from them and determine the degree of backflow protection required. Before specifying or purchasing appliances, evidence should be gained to show whether the required backflow protection is in-built, and if not, the installer must provide it externally to the appliance.

WRAS Approval is one good way to gain evidence of compliance of the design and manufacture.

And a final thought – in addition to a legal duty for the installer and the user to comply with the regulations, the licensing of care homes includes a requirement that all relevant legislation must be complied with, which includes the water fittings regulations.

Flushed with success

At the recent AGM in Melbourne, the Chartered Institution of Building Services Engineers (CIBSE) Australia and New Zealand (ANZ) region elected Paul Angus as the 16th Chair, 30 years since the region was originally founded in June, 1987.

Daniel Collins from SoPHE News caught up with Paul in Sydney to talk about his career to date and find out where it all began.

I originally began my career as a plumbing apprentice for Hall and Tawse, based in Aberdeen in 1992. Upon leaving school, my dad gave me the push to get myself trade background and promised me I would never look back.....and how right he was. My plumbing apprenticeship involved training for four years on at Aberdeen Technical College and on the job learning.

I was really fortunate to be trained by some awesome mentors or journeymen, as we called them. There were a few fantastic characters who also happened to be a little loopy, which might have been working with lead sheet roll or the solvent fumes or maybe a combination of both!. They taught me a great deal, which I'm very thankful for to this day.

Working on the tools gave me plenty of exposure to an array of opportunities, and some prestigious locations, including Balmoral Castle and Marr Lodge in Royal Deeside, Scotland. Probably the most bizarre location was working in Peterhead Prison, North East of Scotland. The contract involved installing anti-ligature showers, as previously the inmates had repeatedly been blocking up the floor drains and leaving the showers operating in an attempt to flood the building. There was certainly no risk assessment back then. The inmates were still in the wing, whilst we were working in the shower block. I still remember on one occasion having to guard the tools with only a single piece of red and white tape separating me from the inmates armed with nothing more than stilsons! As an 18 year old apprentice, I had never felt so vulnerable!

Probably my best encounter as a plumber was a few years later, when the Tall Ships race visited Aberdeen. I was involved with arranging the temporary toilets, accommodation and filling locations for all the ship's crew, oh and the tens of thousands of visitors. I've got some great memories of filling up the water tanks at 4.30am, just when the sun was rising; fog was lifting, one after one the heritage ships sailing, silently and eerily in their full glory into Aberdeen harbour.

I relocated from Aberdeen to the North West of England circa 2000, where I made the transition from "coming off the tools" and into the design office. After an extended break from higher education during my apprenticeship, I continued my training initially learning AutoCAD 2D and 3D. That is where my CIBSE journey initially began, joining originally as a student member in 2001. I continued my higher education for what seemed like an eternity and went on to graduate from the University of Central Lancashire with a "First Class" Honours Degree in Building Services Engineering. I was also awarded the best dissertation prize for my public health research into energy recover from wastewater.

It was around this time I joined WSP, where I was thrown into the deep end working on the Paradise Street, Liverpool city centre redevelopment. It was literally a sink or swim period of my career. Thankfully with

On behalf of everyone at SoPHE we congratulate Paul on this achievement and being such a great ambassador for the Public Health industry.

the assistance and support of my fantastic colleagues, in particular Carl Harrop and Craig Taylor (who I'm still friends with today), I thankfully didn't end up floating down the drain.

At WSP I learned from some of the best Public Health Engineers. It was there I met a great friend Steve Ingle. Steve took me under his wing and encouraged me to join the CIPHE and SoPHE. He had a knack of convincing me to go that extra mile and somehow roped me into to become the CIPHE Lancashire Branch Secretary. After 12 months I managed to turn around an almost defunct branch into one of the most successful in the UK, where I was awarded the President's Award and became a Fellow of CIPHE. I'm really fortunate to have met Steve and for everything that he did for me. He was one of a kind, a fantastic friend. Steve certainly left a mark on me and will continue to pass on skills and knowledge to bring through younger engineers, as he did for me. He will be greatly missed.

It wasn't long after this I began assisting Jonathan Gaunt with the SoPHE News. Actually, thinking about it I think it was Steve who somehow roped me into that too. I initially began assisting with the regional news section, before becoming the editor for number of years liaising with SoPHE committee from Sydney.

When Kate Fletcher relocated to London, I took over as the SoPHE Northern coordinator for a number of years, organising some memorable seminars at the Rain Bar in Manchester, including convincing John Swaffield and Lynne Jack to present. I then handed over the reins to Malcolm Atherton, when I relocated to the WSP Edinburgh Office. It wasn't long after that where Lynne Jack, Joe Hendry and I collaborated to set up SoPHE Scotland. One of my last projects in the UK was on HMP Grampian, the replacement for Peterhead Prison all those years prior, which is kind of ironic, don't you think!

In 2012, I transferred with WSP to Sydney Australia, where I was lucky enough to be involved in some fantastic and iconic projects, including the North West Rail Link in Sydney one of the biggest infrastructure rail projects in Australia. Soon after joining WSP I became further involved in Thought Leadership and have had a significant number of Public Health articles published in a number of industry publications.

After attending a few CIBSE New South Wales Chapter seminars in Sydney, I got asked to join the committee and subsequently recommended to become the Chapter Chair. I've since served in various officer positions within CIBSE, including CIBSE ANZ region Honorary Secretary New South Wales Chapter Chair. I also served on the Knowledge Management Committee and currently the SoPHE Honorary Treasurer.

In June, 2017, I achieved the highest status of membership, being recognised as a Fellow of CIBSE, with only 26 in the ANZ region, being one of the youngest in the region to achieve this accomplishment. Becoming the CIBSE ANZ Chair in June was also a very proud moment for me and couldn't have done it without a little help along the way from all the mentors, colleagues and friends I've made on this journey.

Underfloor heating is a hot topic right now

Mike Darvil from Roth UK gives some advice to avoid getting hot under the collar

Underfloor Heating is now a hot topic in the construction industry. The comfort, low running costs and non-visible nature (no ugly radiators) have made the UK one of the fastest growing markets in Europe for underfloor heating. The UK however is on a very steep learning curve when it comes to underfloor heating with many systems underperforming or just not working. So how do you ensure your system will work once installed?

Most companies selling systems in the underfloor heating market are buying different components from different manufacturers and putting them together to create a system. Some ask the manufacturer to brand the items making the company appear to be a system manufacturer itself.

This may not be the best way to approach the market as most system components from these providers have, the majority of the time, been chosen because they are cost effective, not because they are necessarily the best or compatible with each other.

The start point is the pipe, what is the quality? If it is encased in screed and not something you would want to replace at any stage should it not be of the highest quality? What material is it, it could be PE-RT, a pipe specifically designed for underfloor heating, or maybe it's PEX, or polybutaline. Is it 1 layer, 3 layers or maybe 5 layers, does it have a good oxygen barrier.

The manifolds and mixing sets need to be able to pump and blend to the correct temperature safely, and without leaking.

Controls, are they from a manufacturer who has designed the controls specifically for Underfloor Heating, or are they general heating controls being used for UFH.

Insurance, does the company have design insurance and product failure insurance including any consequential losses?

All of the above are just a few reasons why the system being installed should be carefully considered. Get it wrong and the end client will be cold. No more pipe can be installed, the base design cannot be changed. The design and the quality and compatibility of components is crucial to a system that satisfies demand. With a normal supply temperature between 35 & 45C and longer reaction times it can't just be ' cranked up'!

Consultants and contractors are increasingly often going direct to the manufacturers of the systems to get accurate design information and complete system component compatibility thus eliminating design and product failure issues.

There are three key areas to be aware of. Initial design, product quality, and control of the system. Get these fundamentals right and we can all benefit from a more comfortable living environment that is better for the environment.

Fit for purpose?

> Todays qualified plumbers are investing in the tools, and so a barrier that was in place when most were still using hot works has now been removed.

Press Fit plumbing systems have been used on the continent for up to 40 years. The technology has developed and improved to a level where it is now the preferred jointing method in Europe. So why has the UK been slower on the uptake of this hugely beneficial technology? **Mike Darvil** of Roth UK gives us his thoughts.

The UK plumbing industry is now at turning point. With no hot works on a number of major commercial construction sites, “press fit” jointing is now becoming the preferred method for the plumbing industry. Not to be confused with ‘push fit’, where the joints may not be quite as secure and is widely regarded as a ‘DIY’ solution. Press fit is secure and permanent.

Time is the key. We are all under pressure to work harder, faster and be more economical. Whether it is Aluminium Multilayer, Copper or Carbon Steel, all major manufacturers now offer a press fit solution to the industry. The tooling is readily available for hire on a weekly basis and familiarity on using them is increasing.

Press Fit is now the choice of the professional mechanical engineer who wants a fast, clean easy guaranteed joint. From Aluminium Multilayer to Carbon Steel and Copper, systems are now becoming press fit which is now as reliable and possible more secure than traditional methods of jointing.

But which system do you choose? Aluminium Multilayer is gradually becoming the preferred option, it is more durable and robust than copper or carbon steel, has almost identical linear expansion characteristics to metallic pipe (due to the layer of aluminium), is less attractive to thieves on site as it has very little scrap value, and even up to 32mm it can come on rolls, so less jointing, faster installations.

Traditional manufacturers of copper system often label Aluminium Multilayer Pipe as ‘plastic’. This is far from correct and a better term would be Aluminium, encased in high quality plastic able to withstand constant working temperatures of 80C and 95C for shorter periods. A more common term for this type of pipe is MLCP (MultiLayer Composite Pipe).

Fittings are manufactured from PPSU, or Polyphenylsulfone, which is a heat and chemical-resistant and suited for automotive, aerospace, as well as plumbing applications.

Press Fit jointing has been used on the continent for much longer and is more widely used than the UK. Initially in the UK it was thought of as expensive because of the investment in the press tooling required to do the fittings, but with no hot works allowed on many sites press fit is becoming the preferred alternative.

Today most manufacturers of plumbing systems, be it copper, carbon steel or aluminium multilayer, have press fit in their range, so is the writing on the wall for the traditionalists? A question that only time will answer.

Todays qualified plumbers are investing in the tools, and so a barrier that was in place when most were still using hot works has now been removed. Very gradually traditional joining methods are declining to give way to the more secure, cleaner and more efficient method of joining that is press fit.

The industry is changing, we must all recognise that technology is giving us better systems and we must all make the effort to understand what is on offer to understand what is best for the industry and our customers.

Press Fit is now the choice of the professional mechanical engineer who wants a fast, clean easy guaranteed joint. From Aluminium Multilayer to Carbon Steel and Copper, systems are now becoming press fit which is now as reliable and possible more secure than traditional methods of jointing.

Mike Darvill,
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TECHNICAL PERSPECTIVE

Potential issues with domestic cold water storage tanks

Richard. K. Beattie, Senior Mechanical Engineer at AECOM Edinburgh and **Damien Kane,** Associate Engineer at AECOM Glasgow give us their views on the subject.

The design of domestic cold water systems traditionally relies on fixture unit or demand unit methods to establish the design peak flow rate. Further, calculating cold water storage tank (DCWST) capacities requires reference to these same design guides that also recommend periods of storage. The final tank capacity is often reviewed and adjusted based on individual engineer's experience, engineering discretion and in response to knowledge relating to refill time. Contributory factors such as the building water usage and turnover, occupancy times, and sanitary appliance specification (low water use devices) should also be considered when sizing domestic cold water storage tanks.

A common finding from recent surveys conducted has discovered that where split storage tanks have been installed, the entire contents of the tanks have either been isolated, drained down and decommissioned or that one side of the tank has been drained down, isolated and decommissioned. The primary reason for these remedial works is due to maintenance personnel establishing that the stored volume of 'cold' water is significantly greater than the building demand. Facilities teams have often decided to implement these remedial works as a precautionary measure in an effort to eliminate risks with stagnant water, and ensure improved water quality within the system.

The British Standards (BS) and The Institute of Plumbers (IoP) guidance currently adopt sizing methods that are based on consumption data dating back to the 1970's & 1980's. However, due to the modern advances in technology, combined with the drive to conserve water (e.g. low flush toilets, low flow devices) it is clear there is a need to obtain current and reliable data on building water consumption to allow building water demand to be more accurately assessed.

Without considering the implications of current practices which reduce or limit building water consumption, demand and water tank turnover rates can lead to stagnation of water in domestic installations and result in public health issues.

Sizing method

The following notes the formula and figures used in determining the storage capacity for various building types.

Storage volume =
(number of persons) x
(litres per person) x
(number of days storage or % of 1 days supply)

Estimating water demand depends on the profile of water usage which is unique to every installation and building type. For example, a significant difference will exist between a hospital and a school. Water usage profiles will also be unique due to behaviors and the individuality of the end users and their expectations to use water whenever and however they desire.

Potential causes of DCWST issues

The possibility of over sizing the cold water storage tank;

In a new-build there is a standard burial depth for the incoming water mains however sometimes in older buildings incoming mains water pipeline from the site boundary to the cold water tank room can be at a shallower burial depth; This is relevant as the temperature of stored water can be a result of incoming mains water.

A lack of temperature monitoring in the cold water tank, incoming mains and at the extremities of cold water pipe distribution;

Reduced periods of occupancy and demand such as at weekends and holidays. Seasonal variations in the occupancy of the building can result in longer standing times of water in the cold water storage tanks;

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

Insufficient separation between the heat generating plant and equipment e.g. boilers, hot water storage cylinders and the cold water storage tank room and a lack of appropriate ventilation in the plantroom housing heat generating plant and equipment;

If the occupancy levels in the building after handover is less than envisaged at design stage a lack of domestic water draw-off due to unoccupied spaces and infrequently used outlets may cause elevated temperatures;

Poor maintenance associated with periodic system flushing;

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

The above factors may not be exhaustive, but may contribute to elevating water temperatures and allow bacteria to grow in any domestic cold water tank installation.

Table 1 gives typical recommendations of water storage quantities.

	Type of building	Demand (litre) CIBSE Guide G	Demand (litre) SHTM 04:01	Basis of demand
Hospitals	District general	600	Acute 299-978	Bed
	Surgical ward	250	Specialist 319-531	Bed
	Medical ward	220	Long stay 180-306	Bed
Schools	Nursery	15		Pupil
	Primary	15		Pupil
	Secondary	20		Pupil
Offices	With canteen	45		Person

Table 1: Water demand per person [1][2]

Type of Building	% of the daily demand
Hospital	50%
Schools	50%
Offices	0-50%
Hotels	50%
Sports Facilities	0-25%

Table 2: Daily water storage demand [3]

Potential mitigation measures

Industry review of current standards in relation to the design and sizing of cold water tanks, drawing on the experience of industry professionals and available live data across a wide range of building types and sectors;

Isolate and drain down one cold water storage tank section if it is a sectional tank as in hospitals. This will improve water turnover-to-demand;

Provide a delayed action adjustable height ball valve in the water storage tanks to allow stored volumes to be adjusted if tanks are found to be too large;

Ensure appropriate controls and sensors are provided for monitoring domestic cold water consumption and cold water temperatures throughout the system;

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

Incorporate a 'soft landings' approach to help building users and operators adjust to their new facility and help them understand the building and associated systems design intent and operation;

Include seasonal commissioning in the contract to allow the systems to be adapted to seasonal variations and changes in user need;

Metering of water consumption has become increasingly frequent. The main objective is for BREEAM credits and actual consumption for bills. Through this metering a lot of data has been recorded which should be used to validate design codes;

Encourage clients to learn, for post occupancy evaluation, how the system and building are performing. This includes the logging of live data which can be shared with the industry to help inform trends and future updates to standards and guidance:

Industry and academic research should investigate the variability of peak consumption over an extended period of time to allow for reassessment of current design codes;

Summary

Cold water storage tanks are relatively simple, static appliances, however with ever increasing water efficient low flow devices and building thermal insulation and improved air tightness that result in frequent overheating in cold water systems. The cold water storage tank (and pipework system) needs to be assessed accurately from all aspects prior to its design.

The key conclusion of this article of cold water storage tanks should be to review the sizing guides/methodologies to account for modern practices; this will also require more research data analysis and promotion of knowledge sharing of raw, live consumption data from actual buildings.

Competing interests

The issues raised in this paper have accumulated through several resources and in no way reflect any one specific project or AECOM design. The issues and mitigation measures have been compiled through the experience of multiple engineers from many consultancies over several years.

REFERENCES

[1] CIBSE, Guide G 2014, Public Health and Plumbing Engineering, The Chartered Institution of Building Services Engineers, London

[2] Scottish Health Technical Memorandum 04:01: Water safety for healthcare premises Part A: design, installation and testing, Health Facilities Scotland, July 2014

[3] The Institute of Plumbing, Plumbing Engineering Services Design Guide, Hornchurch, 2002, Essex

[4] UK Water Regulations, Water Regulations Advisory Scheme (WRAS), Stockport 2013

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.

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SoPHE North

Our 7th Northern Dinner of the Society took place, once again at the Midland Hotel Manchester, on Friday 5th May 2017.

As last year's Dinner was such a success in terms of numbers, it was decided to again hold it in the 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 either in the function room itself which had its own private bar or immediately outside of the room in the more "public" bar (!!); 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.

As our usual Toastmaster for the evening had decided to "hang-up his gabble", it fell to myself to keep everyone in order - to the best of my ability!! All 130 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 was left to Natalie Harrison (a Senior Public Health Engineer based in Manchester) to provide this year's! They ranged from "Conversion", "Maul", "Scrum" and ended with "Ruck"!!!

Steve Vaughan address the guests

Once everyone was seated and settled, our SoPHE Chairman Steve Vaughan was invited 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 kind of work that has been undertaken by the Society over the previous 12 months, as well as informing everyone that the number of individual members had increased – again!

The SoPHE Committee and guest speaker, Ian Robertson

Once "the grace" had been said, 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, Ian Robertson.

Ian, in his capacity as BBC Rugby Correspondent for the last three decades, has covered all the great rugby matches all over the world; notably, the Rugby World Cup Final in South Africa when that memorable last match-winning kick was made by an English player & commentated upon by a Scotsman!! Ian has played rugby in his "earlier years", notably for London Scottish and the Barbarians, and has won 8 International Caps for Scotland. He has appeared regularly on our screens for over 20 years on Rugby Special and Grandstand, and has spent several years in the 80's as Rugby Correspondent of the Sunday Times. He has even written over 30 books, including the ghosted autobiographies of Bill Beaumont and Andy Irvine; to persuade Elizabeth Taylor to write the foreword to the family biography of Richard Burton, he was forced to spend a whole week with Miss Taylor in Hollywood!

The Trafford Suite provided a stunning backdrop for the dinner

As you may have guessed, the table names are various words associated with the game of rugby! As Ian has an associated connection with the MS Charity, it was decided by the organising committee to hold a "silent auction", to which the proceeds of it would be donated to the charity. Ian has asked me to pass on his heart-felt thanks to everyone who donated a total of £810 – thank you.

Mike Darvill, SoPHE Industrial Associate Chairman then thanked everyone for attending; he also thanked the respective table sponsors for supporting the evening.

SoPHE Northern 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 7th 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 Natalie Harrison, Mike Darvill, Alan Flight and Peter Hardiman.

Ian and guests enjoying the drinks reception.

With regards to Peter & his involvement with the Dinner, I would personally like to thank him for all his help, assistance & advise with regards to the numerous Dinners we've held & we hope that you'll have a very enjoyable and well deserved retirement!!

As this year's Dinner has once again been a success, the next one (the 8th Northern Dinner) will take place on Friday 11th May 2018 – please take special note of the change in date; this is due to when the Bank Holiday Monday occurs. 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?? Any and all ideas / suggestions will be warmly welcomed.

SoPHE Midlands

On the 21st June we held the first SoPHE Midlands technical evening, which went really well. Steve Vaughan kindly travelled up to attend and gave an opening presentation to the audience of 24. This included both members and non-members, design engineers, industry associates and even a pipework distributor who was incredibly positive about the event.

The technical event was based around drainage pipework systems in multi storey buildings with particular reference to:

– Pipe support
– Fire barrier penetrations
– Acoustics
– Expansion

Saint Gobain, Marley, Blucher UK and PAM Saint Gobain each gave a 20-25min presentation on the use of their drainage pipework systems which highlighted what designers and installers need to consider when choosing pipework materials for tall buildings.

During the questions there was an interesting debate regarding the typical frequency factor that should be used for high rise buildings, this continued after the event and it is clear that designers and manufacturers have their own interpretation of the K factor to be used.

The feedback has been very positive and we will now develop a program of events for the future.

SoPHE London

The Technical Committee is progressing on a number of activities. Some of the key ongoing activities are:

- Technical Bulletins (TB) update
- TB-17-01 " Rainfall Intensities and Drainage Design"

TB-17-01 will aim to answer some of the most pertinent questions, including "Which Rainfall intensities should I use 200mm/hr, 75 mm/hr etc?"

In addition, the FRA, planners and other relevant bodies call for 1 in 100 year + 30 % for climate change and yet different criteria is used for roof drainage in some cases. Why this mis-alignment ?

Even though BS EN 12056 part 3 provides guidance on rainfall intensities to be used, the decision to use relevant intensities proves not to be straight forward in some cases.

We would like to capture as many queries and ideas during the compilation of the next TB " Rainfall Intensities and Drainage Design" , so we are welcoming and any comments and suggestions on the above topic. Email us at; technical@sophe.co.uk

The scope for the next TB has been agreed during the recent Technical committee meeting in June .

"Stormwater Drainage Design" is a wide topic and hence the scope of the proposed technical bulletin will be limited to "Building Rainwater Drainage System" only, aiming to provide guidance on building protection and excludes any external areas.

Technical Reviews
The Technical Committee has been assisting members, including IWG members, by providing guidance and design recommendations on relevant subjects.

One of the recent queries responded to by the Technical Committee includes: **"Drainage System – Pumping system; Discharge pipe sizing and solid handling review"**

The committee is looking to provide more assistance to its members and provide technical advice as appropriate in view to promote knowledge sharing.

If you are a member and would like to receive a copy of the above review, please email us at: technical @ sophe.co.uk, providing your membership details.

SoPHE East Anglia

We have a number of CPD events – currently in the planning stages – and we hope to have details for your diary over the course of the summer.

SoPHE South West

South West region has hosted a series of events in this 2017 first semester with a well received new workshop format for our technical evenings. These workshops have attracted not only young designers eager to learn, develop and strengthen their public health skill set but also experienced designers that are willing to share their vast knowledge and start constructive discussions.

By steering away from the traditional CPD format we are starting to create a cohesive group of engineers that share and create knowledge. We hosted a series of 3 workshops focusing on how to meet hot water demand without oversizing.

On the first workshop we covered why it is important to understand how the building is going to operate to accurately estimate its water demand. We design systems with the sole function of serving the people, therefore, we must understand how people behave and interact with our systems and this varies from building to building.

On our second workshop we covered the difference between point of use, instantaneous, centralized and decentralized hot water generation. In our third and final workshop we will focus on determining hot water peak load, specifying and selecting fit for purpose equipment.

Following on our hot water focus for this year we will host a technical evening in July looking at Tank in Tank technology followed by a Heat Interface Units technical evening on September to lay the foundation to host a workshop in October to discuss the pros and cons of both technologies when used in a centralized heating system for multi-dwelling development.

Come and join us in future events and if you want to contribute to the region contact us we are always looking for proactive people to help organize events that will be regarding for our members.

In terms of Events we will be hosting:

September technical evening:
Heat Interface Units

October workshop:
Tank in Tanks vs HIU in Multi-dwelling developments

SoPHE Oxford

Back in May we hosted a seminar on Thermal Balancing by Oventrop – a very interesting evening which generated some positive feedback.

This was followed on 8th of June by a presentation from Kemper on preventing the growth of Legionella in hot and cold potable water systems using the Venturi principle and included demonstrations in their technical van. The seminar included was followed by a PUB QUIZ.

Looking further ahead, we are organizing a trip to Hydrotec in High Wycombe on the **Thursday 5th of October** for up to 12 people (we can run a second event if there is enough interest).

This trip will cover a CPD accredited presentation and look at products with descriptions of operation such as:

- Water conditioning (electromagnetic HydroMAG)
- Advanced water conditioning (HydroMAG T)
- Water softening ION exchange (HydroION softeners)
- Filtration auto backwash (HydroFIL)
- Bacteriological treatment UV (HydroPUR)
- Bacteriological treatment Chlorine Dioxide (HydroDOS)
- Reverse Osmosis plant (HydroMOS)
- Bespoke water filtration (HydroSOLVE)

SoPHE UAE

Following months of planning a Society of Public Health Engineers (SoPHE) UAE launch event was held at the Dubai World Trade Centre Club on Level 33 overlooking stunning views of downtown Dubai on the 8th March.

SoPHE UAE was initiated in October 2016 by Andrew Russell (Hilson Moran), Simon Lewin (WSP) and Keith Perry (Polypipe Middle East) taking lead roles for SoPHE in the region. It is hoped the partnership and collaboration between the three individuals and their organisations will be key to raising the standards of PHE design and profile of SoPHE in the region.

As expected the launch event was well attended mainly by non-members indicating great potential for the future of SoPHE in the UAE. The evening started with addresses from CIBSE UAE Chairman Raef Hammoudeh of KEO IC who spoke about the status of CIBSE in the region and SoPHE Chair Steve Vaughan of AECOM who introduced the role of SoPHE as a society. Polypipe gave a short presentation to show how they support the society in terms of training and education for public health engineers in the region.

We held a Technical Evening in April on the subject of Active Drainage Ventilation for Tall Buildings.

The subject presentation was provided by Steve White, Technical Director of Studor, a leading design and manufacturing company of active drainage ventilation products in the plumbing industry.

Active Drainage Ventilation has been a subject of a number of research papers over the years with the development of the P.A.P.A. (Positive Air Pressure Attenuator) and Air Admittance valves with buildings being built taller each year and many being designed in excess of 400 metres high. Drainage systems are being subjected to greater loadings in different zones at any one time and the effect of negative transients and positive transients is becoming a greater issue, with system pressures exceeding 400Pa with the loss of water trap seals.

National codes still do not provide sufficient information to the design engineers for tall buildings due to many being based on steady state flows versus the real inherently unsteady state discharges that occur.

Remembering our colleagues

Obituary: Dr Steve Tuckwell

SoPHE Chairman, Chris Northey (pictured above left) presents a SoPHE Honorary Fellowship to Steve Tuckwell (pictured above right)

Dr. Steve Tuckwell, the former M.D of the Water Regulations Advisory Scheme (WRAS) died on 31st March 2017, aged 70. Steve had stepped down from the role of M.D. in January 2012, but continued to work for WRAS in a technical advisory role. This gave Steve more time to spend with his family and to enjoy his other great passions in life, holidaying on his canal boat, gardening and music, everything from Glyndbourne to Glastonbury.

Before joining WRAS Steve had a long and successful career in the water industry.

After gaining a degree in Chemistry (BSc Hons) Steve completed a PhD in Biological Sciences at Dundee University. It was his PhD research project, combining interests in water pollution and agriculture, that first brought water to Steve's attention. So, although his first job was in agricultural research (Harpenden and Nigeria) it was not for him and he soon found himself drawn to the water industry. Working for Anglian Water from 1975 as a water supply scientist, running a small analytical laboratory and providing advice on all scientific aspects of water supply. Before moving to Wessex Water in 1977 where for more than twenty years was involved with the treatment of water supply and sewage, water supply quality, as well as dealing with customers queries and complaints about drinking water. He took over management of the Water Supply Byelaws enforcement for Wessex Water in 1996 and became involved in the Water Industry's national consultation with Government about the proposed Water Fittings Regulations. Later he co-ordinated the implementation of the Regulations in the Wessex Water region.

Steve became Managing Director of WRAS in June 2000, soon acquiring the well-known Regulations experts' habit of taking the lids off WC cisterns to check on the plumbing when staying in hotels. As WRAS MD as well as managing the day-to-day business of the scheme Steve wrote articles for various journals and magazines, including Society of Public Health Engineers' (SoPHE) newsletter, gave presentations around the UK, liaised with the UK Water Suppliers and consulted with manufacturers, trade associations and Government.

In 2015 Steve was awarded an Honorary Fellowship by SoPHE. A fellowship is the highest accolade that the Society can grant to an individual of the highest standing within industry. Steve was also a fellow of the Chartered Institution of Water and Environmental Management and the Royal Society of Chemistry

Steve made an enormous contribution to WRAS, Water Fittings Regulation and the water industry. He will be remembered as a gentleman and for his great breadth of technical knowledge, which he was always willing to share. Steve showed great courage when diagnosed with cancer and continued to work throughout his illness. Steve's health deteriorated markedly at the beginning of March and he died in hospital as a result of a heart attack. He will be greatly missed by family, friends and colleagues.

Obituary: Dr Steve Ingle

By Malcolm Atherton

It is with great sadness that I have to inform everyone that our dear friend and former colleague, Steve Ingle, died during the night of Monday 3rd July 2017. He had been unwell for a number of years since he first contracted pseudomonas, whilst being in hospital for an unrelated illness.

I first met Steve when I joined DSSR Manchester in 2003; we immediately became friends and he effectively was my mentor – in everything but name – who helped me each day with the work I was doing, encouraging me with making as much progress in my career as I could; now look where I am.

There are so many things that I could say about Steve, which I know would be echoed by everyone who met / knew him – a fine gentleman, top bloke, absolute legend, popular, helpful. Yes, he sometimes "put his foot in it" – as we all do at some point or other - and you wished that he'd thought about what he was to say (or write!) before he said it BUT he always cut straight to the point – that was Steve!

He was definitely a character and was larger than life but you knew what to expect from him; there were no "airs & graces" on him, not even when he became CIPHE President in 2013. Steve was very knowledgeable and was well respected within the Industry, more so when he gained his Doctrine. I don't believe I'd ever met a Doctor before, in the plumbing industry.

Steve, you will be greatly missed by an awful lot of people but you will have left a legacy which will live on for many a year.

Thank you Steve.

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

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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

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