Future Proofing Pools

One Day Conference

14 November 2024, Holywell Park, Loughborough.

POOL WATER TREATMENT ADVISORY GROUP

08:45	**REGISTRATION**	**Refreshments and Sponsor stands open**
	SESSION 1	**Chair – Colin Day**
09:30	**Colin Day** *Chair PWTAG*	Welcome, introduction and PWTAG update
09:45	**Roger Currie** *Water Technology Inc*	When Swimming Pools Meet Waterparks - a collision or a fusion?
10:10	**Paul Calvert** *Drinking Water Inspectorate (DWI)*	Future challenges to your supply
10:35	**Q&A**	
10:45	**BREAK**	**Sponsor stands open**
	SESSION 2	**Chair – Martin Wood**
11:05	**Maarten Keuten** *Delft University of Technology*	Non chlorinated pool water treatment with disinfection. The results after 1.5 year operation.
11:30	**Michael Strahand** *Independent consultant*	Online turbidity measurement and pool water treatment
11:55	**Duncan Ockendon** *Xylem Water Solutions UK Ltd*	Swimming Pool Equipment – Monitoring, Control and Interconnectivity
12:20	**Q&A**	
12:35	**LUNCH BREAK**	**Sponsor stands open**
13:45	**Ian Nicks** *PWTAG*	Welcome back and PoolMark Presentation
14:00	**Dr Liz Meinhard**	Drowning by Accident
	SESSION 3	**Chair – Rachel Chalmers & Sue Surman Lee**
14:10	**Richard Lamburn** *Swim England*	Sustainable Facilities –the Swim England perspective
14:35	**Martin Wood** *Pool Sentry Ltd*	Future proofing pool water circulation for safe bathing - science into practice
15:00	**Q&A**	
15:10	**BREAK**	**Sponsor stands open**
	SESSION 4	**Chair – Janice Calvert**
15:30	**James Amburgey** *University of North Carolina*	New US Filter Research: Testing VortiSand, Ultrafine Ceramic, and Coagulated Sand Filters with Organic Batherload for Crypto Removal Efficiency.
15:55	**Kate McKnight** *Myrtha Pools*	Paris Olympics, the challenges faced to deliver 25 pools on time.
16:20	**Q&A**	
16:30	**Colin Day** *Chair, PWTAG*	Winding up comments
16:45		**Meeting Closes**

PWTAG reserves the right to alter speakers and/or titles of papers if circumstances dictate.

PWTAG Member - £96 (inc. VAT)

Non-member - £112.80 (inc. VAT)

www.pwtag.org/pwtag-annual-conference-2024-future-proofing-pools/

POOL WATER TREATMENT ADVISORY GROUP

Speaker Abstracts

When Swimming Pools Meet Waterparks - a collision or a fusion?

Roger Currie
Water Technology Inc.

Since the emergence in the late 1970's/early 1980's of what is now recognised as the established worldwide Waterpark industry, the relationship of leisure aquatic activity in finding common ground with traditional Swimming Pools has not been a seamless process. The respective dynamics of "Sport verses Leisure" are not a ready fit, yet examples of mutual benefit exist – and have all the areas of water-based commonality been identified or exhausted?

40-50 years on, as we stand in 2024, what are those past lessons, and what are current and potential opportunities of utilising components of waterpark attractions, technologies and operational practices in Swimming Pools, as tools for futureproofing?

Commencing with a brief overview of the historical and current worldwide Waterpark Industry to set a backdrop, the session will explore examples of where components of aquatic leisure have (or haven't), could (or couldn't) successfully interface within the traditional Swimming Pools industry - and if any of that potential can be harnessed as part of futureproofing strategies.

Future challenges to your supply

Paul Calvert
Drinking Water Inspectorate (DWI)

The Drinking Water Inspectorate (DWI) is the independent regulator of drinking water quality in England and Wales. The DWI protect public health and maintain confidence in public water supplies by ensuring water companies supply safe clean drinking water that is wholesome and meet all related statutory requirements. Where standards or other requirements are not met, the DWI have statutory powers to require water supply arrangements to be improved.

Drinking water in England and Wales is amongst the most tightly regulated and best quality in the world. Water companies consistently meet the stringent regulatory standards for drinking water, with 99.97% of chemical and bacteriological samples complying with the regulatory standards in 2023. Whilst compliance with drinking water standards is currently stable, the water industry is at a pivotal moment to ensure strategic investment to maintain the quality and sufficiency of supplies, and to maintain consumer confidence in drinking water.

This presentation will discuss the price review process 2024 and the accompanying Asset Management Period (AMP) considering; residual risks in asset maintenance, replacement and enhancement of key assets, as well as risks posed by emerging contaminants such as PFAS, and the broader risks presented from climate change.

Non chlorinated pool water treatment with disinfection. The results after 1.5 year operation.

Maarten Keuten

Delft University of Technology

Health issues and swimming seem to be inextricably linked. To overcome these health issues, Delft University started a research project in 2008 to develop a pool water treatment without health complaints. Ten years and two PhD's later there was a non-chlorinated pool water treatment for public swimming pools. The first public swimming pool with this new treatment-concept was built in Nunspeet, the Netherlands and opened to the public March 2023. Although no free chlorine is used, this new pool water treatment does have disinfection with a double barrier against micro-organisms.

During the past 20 months of operation, several water quality parameters were monitored online, including microbial water quality. Additionally, the microbial water quality was analysed weekly by a laboratory and chemical water quality was analysed by a lab monthly. Beside the microbial and chemical pool water quality, there also was a health-surveillance-system. All health issues from pool users (swimmers and personnel) were studied by the outpatient swimming pool clinic.

This presentation will show the design of this new pool water treatment concept, as well as the results of the first 20 months of operation and the future expectations for non-chlorinated pool water treatment.

Online turbidity measurement and pool water treatment

Michael Strahand

Independent consultant

Online turbidity measurement is commonplace in the water treatment industry. It is used for process control purposes, such as filter backwashes and also for public health purposes, the WHO has clear guidelines on the relationship between health risk and turbidity.

This presentation will explore the following:

1) What is turbidity?
2) How can turbidity be measured
3) How could online turbidity be a benefit in pool water treatment?

Swimming Pool Equipment – Monitoring, Control and Interconnectivity

Duncan Ockendon

Xylem Water Solutions UK Ltd

Chemical dosing in swimming pools has evolved significantly in the UK over the years, driven by advancements in technology and an enhanced understanding of water chemistry and public health. By the mid-20th century, the use of chlorine gas was widespread, but in 1978 the government recommended discontinuing its use, owing to the risk of gassing incidents. The use of hypochlorite consequently increased, but often involved manual dosing directly to the pool, a practice that was both labour-intensive and imprecise.

The introduction of basic mechanical dosing systems started to automate the process, making it easier to maintain consistent chlorine levels. The last 20 years have seen significant technological advancements. Automatic chemical dosing systems have become more sophisticated, incorporating amperometric sensors and controllers to monitor and adjust chemical levels. These controllers not only control chlorine, but also manage pH levels, regulate flocculant dosing pumps, boost UV power based on combined chlorine and can control variable speed drives, ensuring a balanced and safe swimming environment.

Today, the emphasis is on integrating smart technology with chemical dosing systems and other equipment within the pool plant room. Modern chemical dosing systems are highly automated and can be monitored remotely. These systems can now be linked to mobile apps, allowing pool operators to monitor water quality from anywhere. Such mobile apps can also be used to monitor UV systems, variable speed drives and magnetic flow meters.

Sustainable Facilities –the Swim England perspective

Richard Lamburn

Swim England

Richard Lamburn and guests from the Swim England Health & Wellbeing team explore the future of sustainable facilities. This presentation will focus on strategies to reduce operational costs for both existing and new facilities through innovative technologies, including insights from the government's Swimming Pools Support Fund. As the use of our facilities evolves, a shift from leisure to health is not only necessary but essential for securing government support. The Swim England Health team will share valuable insights into effective programs that can be implemented, as well as the critical criteria facilities must meet to successfully support these initiatives. Discover how we can adapt to these changes and create a sustainable future for our facilities

Future proofing pool water circulation for safe bathing - science into practice

Martin Wood
Pool Sentry Ltd

This presents an overview of research carried out by Pool Sentry, in collaboration with a number of science partners and commercial pool operators, to understand the relationship between circulation rate and water quality in operational pools.

Building on a deep understanding of the theory of water movement, solute dispersion and particulate removal by filtration systems we have developed simulation models of pool water quality. These models have been tested against data collected by remote monitoring of commercial pools which includes continuous measurements of, for example, circulation pump speed, pool water turbidity, free chlorine and the rate of chlorine dosing. Using variables such as these we can now predict the impact of any bathing load on key performance indicators such as water clarity and the concentration of Cryptosporidium oocysts following contamination events.

A technical document has been prepared which uses these universal principles of pool water circulation to compare and contrast the UK (PWTAG) code of practice with the European (DIN) standard. A technical note has been prepared from this document which aims to harmonise the terminology across the various regulatory documents and provide a simple approach to calculating bathing loads and circulation rates. The resulting guidance provides a simple tool to future proof pool water circulation for safe bathing whilst also providing a methodology for optimising energy use (including the role of variable speed drives) and minimising the associated carbon footprint.

New US Filter Research: Testing VortiSand, Ultrafine Ceramic, and Coagulated Sand Filters with Organic Batherload for Crypto Removal Efficiency.

James Amburgey
University of North Carolina

Coagulation with 0.05 mg/L of PACl has been shown to increase the Crypto-sized particle removal of a 12-inch (0.3 m) deep sand filter from 23% to more than 99% at a filtration rate of 24 m/h. However, the preceding experiments had no added organics or total organic carbon (TOC) in the water. The addition of 2 ppm of TOC in the 12-inch sand filter at the same coagulant dose decreased removal to 75% after 2 turnovers. A 36-inch sand filter using 0.005 to 0.05 mg/L of coagulant produced average removals ranging from 86% to 90% at 1 turnover after a backwash versus 52% without coagulant. A Vortisand filter showed an initial microsphere removal of 63% with TOC addition. A filter with 22-inches of ultrafine ceramic media had an initial removal of 99.6% with TOC addition but without any coagulant addition. TOC and coagulation both play critical roles in the recreational water filtration removals of pathogens.

Paris Olympics, the challenges faced to deliver 25 pools on time.

Kate McKnight

Myrtha Pools

Paris Olympics, the challenges faced to deliver 25 pools on time. The different types of pool requirement to meet the requirements of the IOC and French Government.

This presentation will also feature the new chloramine stripping system 'breathe' which was installed at Defence, why was this facility chosen and how can this / did this improve the air quality of the venue. The latest test data is now available can be shown to demonstrate the effect of this new technology / system.

Special Guests

PoolMark

Ian Nicks

PWTAG

PoolMark is the UK National Standard for quality, healthy pools. The PoolMark certification is an assurance to operators and to the public that the pool meets essential healthy pool operational standards.
This guest talk will give an overview to PoolMark and also present three plaques to three newly certificated facilities.

Drowning by Accident

Dr Liz Meinhard

Dr Liz will be talking about their publication *Drowning By Accident.* Liz is a UK doctor whose father used to be swimming pool manager and taught her to swim. More than 600 people die by drowning in Britain every year. Drowning accidents take place because we don't recognise water as a hostile environment. We overestimate the strength and endurance of our bodies and underestimate the power and deceptiveness of water.

This book explains why it is so easy to drown, where accidents happen and how to save lives by early rescue and resuscitation.