



## SWAN-WWEM 2022 Roundtable Recaps

### **Roundtable 1: How does smart help your best business case for PR24?**

*Led by Dale Walker, Head of OT (Dŵr Cymru Welsh Water)*

### **Roundtable 3: Maximising asset life through condition-based monitoring**

*Led by Charlotte Stewart, Smart Water System Engineer (Anglian Water Services)*

### **A discussion with Safe Smart Systems, an Ofwat innovation fund project: How can the introduction of automation and AI go wrong when working with our people?**

*Led by Fionn Boyle, Strategic Innovation & Shop Window Lead (Anglian Water Services)*

### **Roundtable 1: How does smart help your best business case for PR24?**

**Leader:** Dale Walker, Head of OT (Dŵr Cymru Welsh Water)

**Attendees** – Royal Haskoning DHV, Dŵr Cymru, Anglian Water, Welsh Government, Maplesky

- Do regulators understand smart technologies and its use in the water industry?
  - Unanimously agreed regulators do not understand smart and its use, but this could be due to water companies not explaining it in previous price reviews.
  - As an industry, we need to educate regulators to create a mindset change to embrace smart and how it supports our strategic outcomes.
  - Regulators should be looking to even out measures with others and allow targeted change rather than diluted change across multiple areas.
- We should own the message both to the media and regulators to drive our agendas and not have agendas driven for us by inaccurate reporting. For example, using the media scrutiny of pollution as a driver for change.
- There is a lack of understanding within water companies to fully embrace smart due to the inherent risk of measuring and monitoring areas which are not already measured - it's like opening Pandora's box - you have to deal with the unknowns once they become known. This puts increased pressure on the water companies.
- Business cases for price reviews need to be data-driven and this can be difficult for smart technologies. However, we can tell the story differently and drive both customer and regulator education to further the smart journey.
- Through the PR24 framework (which also looks at longer term strategies) we can utilise smart as a method for determining both asset performance and asset health, allowing greater confidence in longer term asset investment.



- Smart is a fundamental building block for our strategic outcomes and therefore should be intertwined with all other business cases submitted under price review and not as a separate case, since smart allows you to target multiple diverse drivers across the business. ‘Smart helps you be better’
- While there’s always learning to be had, as a whole the water industry does not like to promote failures. Failures (unexpected outcomes) are a valuable source of learning and should be published as well as included in business cases. We should also share challenges, particularly those affected by climate change, with customers and make it relatable to them. For example, publicise the effect of the drought on areas of natural beauty and water visitor centers to drive down per capita consumption and increase water conservation.
- Smart technologies can be used to determine root causes of issues and therefore not only drive investment but prevent and predict incidents.
- In addition to educating customers, we also need to educate developers and raise the awareness of the societal benefit in the round for everyone if water and waste infrastructure is maintained.

## Roundtable 2: Maximising asset life through condition-based monitoring (CBM)

**Leader:** Charlotte Stewart, Smart Water System Engineer (Anglian Water Services)

- **What is CBM?**
  - Series of coordinated activities designed to monitor the condition of assets - pumped or rotating.
  - Huge variety of tools and methods:
    - visual or physical inspections
    - monitoring existing operating parameters i.e. flow/pressure
    - dedicated sensors monitoring temperature, vibration, voltage, current etc.
- **Why do CBM?**
  - Preventing catastrophic asset failure and improving energy efficiency through maintenance based on need rather than time.
  - Time based & Reactive ---> Proactive & planned
  - Possible Benefits:
    - Reduce risk of I2S
    - Reduce unplanned outage
    - Minimise unexpected emergent capital expenditure
    - Provide a planned and safe method of handling reactive maintenance to avoid the inevitable H&S risks associated with reactive work
    - Prevent over and under maintenance
    - Validate refurb work



- Validate successful maintenance plans
  - Ensure appropriate asset selected for the job and giving water companies the time to review system needs to change the asset type when a replacement is needed instead of emergent like for like replacements
  - Reducing frequency of asset replacement by maximising asset life
- **Anglian Water current CBM programme:**
    - 180 critical assets monitored with dedicated CBM equipment.
    - Dashboard for monitoring alerts, trends and statuses regardless of supplier used.
    - By the end of year 3 the number of assets monitored will be over 300, and by the end of the AMP significantly higher.
    - Now working on developing a robust process for actioning these alerts that could be described as business as usual.
    - A lot of people in the business use the terms condition-based maintenance and condition based monitoring interchangeably, we acknowledge that they're very different but one cannot happen without the other. Implementation of condition-based maintenance is very difficult without the condition based monitoring in place to provide data insights and drive the maintenance priority, however it is difficult to get value from our condition based monitoring until there are maintenance processes in place to allow for condition based maintenance rather than time based.
  - **Selecting assets to monitor** and what priority should be considered i.e. asset criticality based on what? Risk of failure, likelihood of failure, population served, impact on critical infrastructure or performance commitments? Very difficult to define as there are so many angles to approach and each gives a different order of priority.
  - **Making use of CBM data:**
    - How to baseline assets – use of pump curves, rate of change in an assets condition, should we monitor condition or performance, assets may be performing effectively but their condition is poor and vice versa – is it right to intervene? Two-way data feeds to ensure CBM providers are receiving feedback of pump data but also effective feedback loops from water companies on what action is completed as a result of the insights so suppliers can continuously improve their solutions. Use of AI and ML by CBM providers to improve the insight they provide, identifying common failures and their related interventions.

**Roundtable 3: A Discussion with Safe Smart Systems, an Ofwat innovation fund project: How can the introduction of automation and AI go wrong when working with our people?**

**Leader:** Fionn Boyle, Strategic Innovation & Shop Window Lead (Anglian Water Services)



- When talking about AI you need to understand your audience even more so than in normal change programmes. You cannot stereotype between C-suite and operators. Different people will have their own views of the solutions, not necessarily related to their role.
- Explainable AI is a methodology which brings co-creation to the heart of AI creation and brings out user centric design. Alongside delivery you should utilise KPIs which are relevant to all levels of the organisation to demonstrate the value from front line to c-suite.
- There is always going to be distrust, there should be a healthy level of distrust to begin with that can then enable growth.
- AI is there to enhance the operator, think of it as a virtual assistant not a virtual operator. Great analogy of a car dashboard. Without your speedo and fuel gauge you wouldn't be able to trust your operation of the car, this is an augmentation of the machine – similar to digital twins and AI on pumps. It is about how you enable better operation of your systems.
- For all the advancement in technology you must ensure your organisation is ready and holds the competency to be able to use AI, invest in the people as much as you invest in the technology to ensure ongoing use.