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Paul Thies: When it comes to wastewater management, utility managers are discovering that deploying a data-driven approach to their operations is helping them to realize cost and resource efficiencies and to avoid emerging problems like never before. This keeps things flowing, which is music to the ears of customers, plant operators, and people concerned about offsetting potentially damaging environmental incidents. Hello. I'm your host, Paul Thies. On this episode of *If/When* I discuss the concept of data-enabled utilities with Simon Gaskell, Jacobs' senior associate director, and Samantha Sloan, network business manager of United Utilities.

They shared their insights on how digital wastewater systems perform in comparison to analog systems, as well as some of the more common challenges of implementing a digital program to an existing wastewater system and more. Simon and Sam, thank

We understand how it's being designed and the relationship with the likes of water courses and river systems. We can really understand under what conditions we could expect pollution events to occur. I think what's neat is you don't necessarily need sensors in absolutely every single location, so you don't need the whole thing monitored to be able to be effective. To do that, especially in the UK, would be really cost-prohibitive.

How we can infer this impact against using GIS data and wastewater models combined with all this data together really helps us have the potential to detect these problems proactively. In tools such as Jacobs equity and platform, we can boil down a lot of this data, which can be quite overwhelming for individuals or operators. We can give a simplified situation awareness picture and we can blend it with analytics and that business logic rules that the business can set. Then we can give teams prioritized recommendation of where they could be intervening in the network to prevent a blockage.

When we're seeing behavior in a sewer going above the level expected, when nothing's changed, it's not raining, why is it going up? There's a potential blockage. We could go in and intervene ahead of time and avoid that blockage, potentially causing a pollution into a watercourse in that example.

Paul: Okay, great. Then, Sam, let's talk a little bit about how you would weave in a data-driven approach to an existing wastewater system. Tell us, what are some of the common challenges for implementing a data-driven approach and how are those challenges overcome when you have an existing wastewater system that you're

Simon: Sam, what I really like when the related benefits to the teams more is when you've got more of a predictable plan work without that pressure to try and resolve things in a reactive way, you're working in a much more measured, calm approach and could be in daylight hours and ultimately the impact on just having that safer working environment as a result.

Samantha: Definitely, Simon, and certainly being able to go out there proactively, take your time, carry out thorough investigations rather than reacting to initiatives arise and trying to mitigate it. What we're seeing is being able to spend more time on site, do proper root cause analysis on site, and whether that's CCTV camera footage, upstream, downstream, really understanding the asset condition rather than it being focused on resolving that customer-driven issue and making sure the customer service is there.

We're really being able to focus more on the assets and take our time and understand in that root cause, which will only help improve performance in the future, and help us plan better and more effectively in the future as well. I'd certainly say that kind of a more calm environment, yes, you're spot on with that because it really allows us to take our time and understanding what these issues are that we're resolving.

Paul: Then, Simon, can you tell us how can improved wastewater network performance contribute to a positive environmental impact? I know we talked about trying to prevent pollution events, but can you expand on that a little bit? How's this digital approach contribute to more of a positive effort for the environment?

Simon: It was a great question, Paul, and I suppose really relevant just in the increasing expectations placed on responsible network management organizations to have that net positive impact on the environment. It's becoming a real focus in the UK especially currently.

I'll pick out a couple opportunities. I mean, first, there's kind of what we talked about already about we have a maximizing the potential of the network and more resilience in it, but allowing it to reach its full potential of holding as much volume of wastewater as it's designed to, particularly where we've got combined sewer flows, which we have got wastewater from customers and rainwater together. We're really have the opportunity to reduce the risk around pollution. If we have a network which is fewer obstructions, we've got more effective flow than at risk of spilling is being reduced.

I think the fact that we got a degree of observation and real-time monitoring means that there are instances where there's unavoidable spill events, but if in fact that we

of water wastewater into those treatments we've got the opportunity to have greater efficiencies and how they actually operate.

Sam has touched on there, so almost like the running costs of all the powered assets in the network, these could be pretty, these processes are fairly high consumers of energy and therefore carbon as well as chemicals and others. We can really sort of an opportunity to drive efficiencies in the consumption there and therefore overall from reduce the impact on the environment as a result of what we consume.

Paul: Sam, let me come back to you and we touched on this just a little bit, when we talked about starting first with the process and with the people and then folding in the technology, but what do you say to someone in wastewater management who says, I'm not a data scientist, or I don't have time to keep up with the latest advances in cutting edge computer technology or something to that effect. How do you put their minds at ease about deploying this kind of technology into their systems?

Samantha: They are common concerns or feelings really, and you can feel that way of barking on any change. I don't think people that come off that with those kind of queries or concerns are alone. What I would say is definitely to focus on the why, why do you need to tick on this change. What is that your burning platform? Because ultimately if as a business you're deciding to take this sort of transformation on, you need to understand the why, and ultimately doing that helps you then really focus on the prioritization of efforts within your own day-to-day within your teams and various stakeholders across the business.

Because bringing it back to the why, and for us, like I said, it was the customer. It might feel I don't have enough time to focus on cutting-edge technology or I'm not a data scientist, but why are we doing it? We're doing it because we need a step change in the service we provide to our customers. What other way can you do that? Really for me, it's always bringing it back to the why, what is your burden platform for change? Because ultimately for me, that puts everything into perspective. I guess the last bit there around watch your, I'm not a data scientist I don't want anything about that.

It doesn't take a team of 100 data scientists to implement a digital transformation, it takes data scientists, but it also takes engineers, it takes operators, it takes people, managers, it really takes a big collaboration across different skill sets to be able to deliver a transformation within a wastewater management system within any organization really. I would never say, "Oh, you need to have a certain skill set to be able to contribute." Definitely not. I think going back to what I said at the start, if you've got that platform for change and you know what you need to do, then that should make everything else clear and really fall back into perspective.

Paul: Then, Simon, let me ask you my last question for today. What's next on the horizon for a data-driven approach to wastewater management? Where do you see developments and emerging technology taking us next?

Simon: Thanks, Paul. I think one word would be optimization. The costs associated with optimizing what you already have in terms of infrastructure working for you, they're dwarfed compared to those where you have to invest in building new infrastructure to deliver the same level of capacity so more capability in the network.

