

Liquid assets

Water and waste treatment plants are among the oldest anywhere, but don't imagine they're bereft of new engineering developments. Brian Tingham reports

It's easy to imagine that an industry as established as water and waste treatment must be well and truly mature, with processes and plant changing little. Well, yes and no. Yes, the equipment is in more or less satisfactory operation throughout most of the UK, but, no, plant owners are not complacent. Change is underway – and it's not just about updated technology, important though that remains.

Why? Several reasons: the commercial landscape is moving; populations continue to rise; and energy costs are still escalating. Most important, however, as a result of all these and the green agenda, many water companies have, in recent years, started adapting their plants to become more self-sufficient, in terms of energy. And that has changed the game.

Andrew Reeks, business manager for Siemens' municipal water unit, points to regional water and sewage treatment companies, such as Anglian Water, Northumbrian Water and Welsh Water, all of which have installed advanced anaerobic digesters to recycle energy from sewage sludge.

Slick engineering

"So they now have to keep feeding these plants to maintain the energy cycle," explains Reeks. "But that means more sophisticated control systems to optimise the treatment works' sludge processes and so maintain gas potential." It also means more automation and better maintenance management systems, because they cannot rely on scarce skilled technicians to keep intervening.

It's happening quietly, but this change alone is altering water companies' approaches to plant management. "In the past, if part of a water treatment plant went down, they could work round it and get it going again, because of the capacity built into the system and the nature of these processes. Now, just like in a factory, there's more of a dependence on all parts of the 'machine' working – and restarting anaerobic digesters isn't trivial."

But change isn't just happening at the big picture level. Take ultrasonic systems that have long since become mainstream for level measurement – to a large extent displacing mechanical and hydrostatic instrumentation. The talk now is of installing transducers only, and relying on local PLCs for data capture, signal processing and the rest. Reeks argues that it's about reducing complexity, both in terms of maintenance and operations – with the latter being served by suitably sited HMIs, instead of local instrument displays.

Talking of which, networked HMIs – which enable operational plant visualisation from anywhere – are very much on the agenda. It's fully two years since Wessex Water upgraded its Poole treatment plant, with Siemens providing precisely this technology. "Now, an engineer might be at the inlet works, but see, from the screen, that something is happening at, say, a digester. Instead of having to go there, he can make changes, such as adjust the aeration blowers, remotely on that HMI to bring control back in line. That brings process benefits, energy saving benefits and time savings, too."

Such developments chime with the industry's recognition that very few new plants are likely to be built anytime soon, for reasons of geography and capex. So the issue now is getting more from less, and dealing with the problems of plant and automation system obsolescence. But, as Reeks says, one of the dilemmas for plant owners wanting to implement new controls – with their (probably) Profibus-based digital networks to instruments, control valves, MCCs (motor control centres) etc – is that fieldbus and power cables don't mix.

"So how are we going to fit in with the existing civils and cable tray arrangements?" wonders Reeks. Will the industry turn to fewer, but more powerful, PLCs on a distributed network? Given that small PLCs these days pack quite a punch, that's entirely feasible – probably preferable.

But what about remote I/O being used to overcome the fieldbus cabling problem, along with wireless networks? The benefits: no digging new trenches, so huge project cost reduction; and the opportunity to instrument some plant hitherto deemed infeasible and probably left on manual.

Time will tell. For now, though, the latter is a step too far – the big worry being security on plant deemed essential infrastructure. Certainly, you won't find wireless field networks approved in the CPNI (Centre for the Protection of National Infrastructure) guidelines – even though the high-risk oil and gas sector is increasingly welcoming the approach. **PE**



Andrew Reeks, business manager for Siemens' municipal water unit: "Water companies now have to keep feeding their digesters to maintain the energy cycle"