

WHITE PAPER

From Flood To Control

How Data-Driven Alarm Management Helps UK Water Companies Meet the Demands of a New Regulatory Era

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Executive summary

If you work in water operations, you will recognise this picture. Your control room receives tens of thousands of alarms every quarter. On a normal day, managing the flow is demanding. When a storm rolls in, the volume spikes, and your operators face an almost impossible task of separating the critical from the noise. Important alerts get missed. Issues go undetected until equipment fails. Callouts happen out of hours. The next morning, the team is playing catching up, rather than staying ahead.



This is not a failure of effort or skill. It is a structural problem, one that has been building for years as SCADA networks have grown, monitoring obligations have expanded, and staffing has not kept pace. It is a problem that the entire sector is grappling with, and one that is about to become significantly more urgent. The UK water sector is undergoing its most significant regulatory transformation since privatisation. The January 2026 Water White Paper, the abolition of Ofwat, and the introduction of open, real-time environmental monitoring are raising the bar for operational performance, and for the data that underpins it. Companies that cannot demonstrate reliable, auditable alarm management will face financial and regulatory consequences.

This paper sets out what is changing, why it matters, and practically what water operations and engineering teams can do about it. **ProcessVue**, working with **SolutionsPT**, provides the tools to help. But we begin where any honest conversation about this sector should begin: with the operational reality your teams face every day.

1 The Alarm Problem Is Not New, But The Stakes Just Changed

UK water utilities receive between 40,000 and 60,000 alarms from SCADA systems per quarter. During major weather events, that number rises sharply. Control rooms operate around the clock, managing everything from water quality to pump performance to sewer overflow monitoring.

The volume itself is not the core problem. The core problem is that a significant proportion of those alarms do not require a response. Research into Northern Ireland Water found that approximately 57% of alarms lasted less than five minutes classified as nuisance alarms that consume operator attention without ever indicating a genuine issue. When the ratio of signal to noise is this poor, the natural human response is to start filtering to develop mental shortcuts about which alarms to act on and which to let slide.

That filtering is understandable. It is also dangerous. Because the alarm that gets paused, or the pattern that goes unnoticed, is sometimes the one that matters.

“Failing to process this information, such as missing alarms arising from operational abnormalities, can result in inadequate treatment of potable water which threatens public health.”

Industry technical guidance on SCADA alarm management

The HSE is direct on this point. Its guidance on alarm management references the Milford Haven Refinery explosion, an incident where staff were faced with a barrage of alarms for five hours before the event, as evidence of what poorly managed alarm systems can produce. The principle applies in water operations just as it does in process industries.

The industry has recognised this for some time. Two standards provide the framework for what good alarm management looks like:

- **EEMUA 191:** The Engineering Equipment and Materials Users Association guidance on alarm system design, management and procurement. The primary reference standard for UK industry.
- **ISA 18.2:** The International Society of Automation standard for alarm management systems. Increasingly referenced in regulatory and audit contexts.

Awareness of these standards is relatively widespread. Consistent compliance with them is considerably less so. And that gap is about to attract much more scrutiny.

2 A Sector Under Pressure: The Regulatory Context

To understand why alarm management has moved from a technical best practice to a board-level concern, it helps to understand the scale of the regulatory shift currently underway.

2.1 | The January 2026 Water White Paper

Published on 20 January 2026, the government's White Paper: 'A new vision for water' represents the most significant overhaul of the sector since privatisation in 1989. Its implications for operational teams are direct and immediate.

The most consequential changes from an operations perspective are:

- **End of operator self-monitoring.** Water companies will no longer be permitted to assess their own environmental performance without independent oversight. A new Open Monitoring approach will make wastewater performance data available in near-real time. The era of marking your own homework is over.
- **Infrastructure MOT checks.** A Chief Engineer will sit inside the new single regulator, conducting mandatory health checks on pipes, pumps and assets. Companies will need to demonstrate asset performance, not just self-report it.
- **A new Performance Improvement Regime.** Companies that underperform will face a structured regime with both financial penalties and recovery requirements. The regulator will have powers to intervene early before decline becomes entrenched.
- **A powerful new single regulator.** Ofwat will be abolished and replaced by a body combining the water functions of Ofwat, the Environment Agency, the Drinking Water Inspectorate and Natural England. This integrated oversight removes the gaps that allowed poor performance to persist across regulatory boundaries.

2.2 | Ofwat's Enforcement Posture, Already Tightening

The White Paper formalises a direction that Ofwat had already begun moving in. In its major investigation into all wastewater companies, the largest ever undertaken by the regulator, Ofwat found a pattern that will be uncomfortably familiar to many operations teams:

- Companies had installed flow monitors but had not adapted their business processes to act on the data.
- Compliance monitoring was being done on an ad hoc basis rather than routinely across all sites.
- Executive teams and boards were not regularly receiving the compliance information they needed.
- In some cases, companies had data indicating potential non-compliance but failed to act on it for years.

“Companies need to reduce the use of storm overflows. We want to introduce measures to hold them to account for this and to ensure companies are effectively monitoring their use of storm overflows.”

Aileen Armstrong, Senior Director, Ofwat, 2023

Ofwat has now introduced financial penalties for companies that fail to monitor storm overflows. Critically, where overflows lack working monitors, Ofwat assumes the situation is twice as bad as the sector average when calculating penalties. The financial incentive to get monitoring right, and to act on what monitoring reveals, has never been stronger.

£104bn

Investment programme
2025 - 2030

£11bn

Storm overflow
improvements alone

£290bn

Enhancement investment
needed by 2050

The financial scale of AMP8 (Asset Management Period 2025–2030) means this is not a time when water companies can afford operational blind spots. With £104 billion committed to infrastructure over five years, the pressure to demonstrate that investment is being managed effectively, and that operational data is being used, is immense.

3 The Operational Reality: Why This Is Harder Than It Looks

None of the regulatory pressure described above is news to operations and engineering managers. What is sometimes underappreciated by those outside the control room is why the data problem persists despite genuine effort to address it.

3.1 | The Alarm Flood Is Structural

Water networks are large, distributed, and increasingly instrumented. As monitoring obligations grow, more overflow monitors, more flow sensors, more telemetry points the volume of data flowing into control rooms has increased dramatically. SCADA systems were designed to capture everything. They were not designed to help operators decide what matters.



The result is that skilled operators spend a significant portion of their time managing the data, rather than acting upon it. Recurring nuisance alarms consume attention that should be directed at genuine anomalies. Alarm rationalisation exercises provide route to relief, but will be temporary, unless ongoing maintenance is established as networks and operating will continue to evolve over time.

3.2 | The Skills Picture Is Deteriorating

The alarm management challenge is compounded by a workforce crisis that is accelerating rather than stabilising. This is According to the 2025 Water Industry Labour Report, which surveyed more than 4,300 engineers across the UK water sector with the following outcomes:



This is happening precisely as AMP8 demands the largest capital program in the sector's history. The people who carry decades of operational knowledge, who know instinctively which alarms to worry about and which to ignore, are leaving. The people replacing them do not yet have that accumulated year experience and system knowledge.

Experienced operators develop an intuitive understanding of their networks over time. They know that a particular pump always generates a brief low-level alarm during startup, or that a specific site behaves unusually during the first hour of heavy rainfall. That knowledge is rarely documented. When the employee retires this key data effectively walks out of the door at the same time. Replacing this is extremely difficult. This loss of core knowledge has been seen in many industries over many years, it is not a new situation.

This is not a criticism of the industry's recruitment or retention efforts, the structural factors driving the shortage are well beyond any individual company's control. But it does mean that the tools available to control room operators need to work harder. They need to surface the right information, in the right context, at the right time, and do so in a way that supports less experienced staff making good decisions quickly.

3.3 | The Data Is There, But Not Being Fully Used

One of the more striking findings from Ofwat's investigation is that the underlying data problem is not primarily a collection problem. Most water companies have substantial monitoring infrastructure in place. The failure point is what happens after data is collected.

Ofwat found that companies had installed flow monitors but had not adapted their processes to use the data effectively. Data was available that could have identified non-compliance, but the systems and workflows to surface that information to the people who needed it were not in place. As of late 2025, approximately one third of utility processes still rely on paper-based workflows, and manual data extraction remains a significant barrier to timely decision-making.

The Core Challenge

The problem is not a shortage of data. It is a shortage of the right information, at the right time, in a form that enables action. That is precisely the gap that ProcessVue is designed to close.

4 What Good Looks Like, A Proof Point From The Sector

The transition from reactive to proactive operations is achievable. It has been done. The Southern Water deployment of AI-driven pump station alerting, published in Water Industry Journal, provides a concrete illustration of what changes when the right analytical approach is applied to alarm data.

4.1 | The Starting Point

Southern Water's pump stations were monitored using static Hi-Hi alarms. During periods of heavy rainfall, these triggered across multiple sites simultaneously. Operators had no reliable way of determining which sites genuinely required attention. The practical response, pausing alerts to manage the volume, meant that real issues went undetected until pumps had already failed. Reactive callouts, frequently out of hours, were the norm. Operations teams described feeling unable to tell which alerts required response. Data was available that could have identified non-compliance, but the systems and workflows to surface that information to the people who needed it were not in place.

As of late 2025, approximately one third of utility processes still rely on paper-based workflows, and manual data extraction remains a significant barrier to timely decision-making.



4.2 | The Approach

AI-driven alerting was deployed to analyse pump start/stops, wet well levels, and performance trends, correlating them with live weather conditions to identify anomalies before failure occurred. Rather than binary alarms, the system generated descriptive, actionable alerts: run time longer than expected, wet well level high with no pumps active, pump possibly ineffective. Each alert told operators not just that something had happened, but what it meant and what response was likely required.

4.3 | The Outcome

The transition was measurable and significant:

- Operations shifted from reactive to proactive. Issues were identified early and resolved, including blocked pumps, worn impellers, level control faults, and burst rising mains.
- Alerts became trusted. When operators trust their alerts, they act on them. The alert hit rate reached 88% following resolution of data issues and threshold calibration.
- Callouts moved to normal working hours. Early detection meant issues were addressed before they became failures, reducing the out-of-hours burden on field teams.
- Operators gained confidence. Teams began using visualisation tools for real-time situational awareness across the network, rather than reacting to individual alarms.

“Alerts were more trusted, more actionable, and often resolved during normal working hours rather than out of hours as the machine learning based dynamic alerts detected early signs of impending pump station failure taking account of ambient weather conditions.”

Water Industry Journal: Southern Water case study

This is what good looks like. Not a perfect system, the 88% hit rate was achieved after iterative refinement, not immediately. But a system that operators trust, that surfaces the right information, and that moves a team from constantly catching up to genuinely staying ahead.

5 How ProcessVue Addresses The Challenge

ProcessVue, is designed specifically for the kind of operational environment UK water companies are managing. Its capabilities map directly to the challenges described in this paper.

We are not going to use this section to list features. We are going to describe what changes for your operations team when ProcessVue is in place.

5.1 | From Alarm Flood To Situational Clarity

ProcessVue analyses the stream of alarms coming from your SCADA and telemetry systems and applies the EEMUA 191 and ISA 18.2 frameworks to give your control room a near real-time, structured view of alarm performance. Operators can see at a glance whether the control room is at risk of missing critical alarms. They can identify which sites or assets are generating the largest proportion of alerts, and drill into root cause analysis to understand why.

The result is a control room that is managing its alarm environment rather than being managed by it. Nuisance alarms are identified and can be addressed at source. Recurring patterns are visible rather than buried in volume. The cognitive load on operators, particularly less experienced ones, is reduced substantially.

5.2 | Proactive Identification, Not Reactive Response

ProcessVue's analytical capabilities allow operations teams to identify assets that are trending towards problems before those problems manifest as failures. Pattern analysis across historical alarm data reveals which equipment behaves unusually under specific conditions, and flags when those conditions are developing.

This shifts the maintenance model from fix-on-fail to predict-and-prevent. In a sector where reactive callouts are costly, where out-of-hours responses carry real operational and human costs, and where asset failures can trigger regulatory consequences, this shift has direct financial, reputational, and compliance value.

5.3 | The Data Your Board And Regulators Need

One of the most consistent findings from Ofwat's investigation was that boards were not receiving the compliance data they needed to make informed decisions. ProcessVue addresses this through structured reporting that translates operational alarm data into the performance metrics and compliance indicators that management and regulatory reporting require.

This is not about creating additional reporting burden. It is about ensuring that the data your control room is already generating flows to the people who need it, including the board, and including the regulator in a form they can digest and act on.

5.4 | Supporting Your Team Through The Skills Transition

ProcessVue provides the analytical context that helps less experienced operators make better decisions faster. When an alert appears, the system provides not just the raw alarm information but the historical context, how has this site behaved before? Is this pattern consistent with previous incidents? What response has been effective in similar situations?

This does not replace operational experience. It makes operational experience more accessible distributing the insight of your most knowledgeable engineers across your entire control room team.

Operational Challenge	ProcessVue Capability
■ Alarm flood - 40-60k alarms per quarter ■ 57% nuisance alarms consuming operator attention ■ Critical alerts missed in high-volume periods ■ Boards not receiving compliance data ■ Reactive maintenance, out-of-hours callouts ■ Less experienced operators replacing retiring experts ■ Open Monitoring mandate, real-time public data	■ Rationalisation and KPI dashboards aligned to EEMUA 191 and ISA 18.2 ■ Root cause identification and pattern analysis - fix the source, not the symptom ■ Real-time risk assessment, is your control room at risk of missing what matters? ■ Structured reporting from operational data to management and regulatory dashboards ■ Historical trend analysis and proactive anomaly detection ■ AI-assisted decision support, contextual information at the point of decision ■ Auditable alarm records and performance data to support regulatory reporting

6 The Path Forward: Starting The Conversation

The regulatory environment is not going to become less demanding. The skills challenge is not going to resolve itself quickly. And the alarm volumes water companies manage are only going to grow as monitoring obligations expand.

But none of this is unsurmountable. The companies that navigate this period most effectively will be those that treat their operational data as an asset that move from generating alarm data to genuinely understanding it, acting on it, and demonstrating that they have done so.

ProcessVue is working with water companies across the UK to make that transition practical. We understand that every network is different, that every control room has its own established ways of working, and that technology adoption in operational environments has to be managed carefully. We start with your data, your systems, and your specific challenges and we build from there.

If the challenges described in this paper resonate with your operational experience, we would welcome the conversation. Not a product demonstration a conversation. We would like to understand your situation before we talk about solutions.

About ProcessVue

ProcessVue is a specialist alarm management and operational analytics platform designed for asset-intensive industries. Its capabilities are built around the EEMUA 191 and ISA 18.2 alarm management standards and are deployed across water, utilities, and process industries. ProcessVue helps control room teams move from reactive alarm handling to proactive operational awareness.



30 Years of Experience
across Safety-Critical
Industries

processvue.com

7 Sources

This paper draws on the following primary sources:

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Ofwat, June 2022
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- Perfect storm hits water engineering: skills shortage deepens in 2025:
Engineering and Technology Jobs, June 2025
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Health and Safety Executive guidance
- Everything you need to know about UK water reforms:
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