i2O™
Intelligent water networks

Water Water Everywhere

This thought piece is designed for Network Directors and their teams, Control Rooms, Risk Managers, Engineering Contractors, and Customer Services teams. It illustrates the potential of technology to significantly improve the way that events are managed.

Water Water Everywhere (WWE) is committed to supplying high quality drinking water, and providing an excellent service to our customers and communities.

We recently experienced a serious network event and this is what happened:

2:00AM — A pipe burst. No alarm was triggered in the Control Room.

5:00AM — A driver reported to the police that a road was flooded. Rainfall had been relatively heavy in the previous 24 hours so it wasn't clear what the cause was. The police went to investigate and identified the likely cause as a burst main.

5:30AM — At 5.30am the police called WWE to report the issue.

6:00AM — As people started to get up they found that they had no water and called WWE.

Customer Services asked the Control Room if there was a known issue. The Control Room was unable to confirm that there was one and called the Standby Technician to ask him to investigate.

The Standby Technician went to site and identified that there was indeed a burst main. He immediately dispatched a leak detection team and the standby repair gang to attend site. The Standby Technician then called the Network Manager and started to investigate which valves to close to isolate the burst and closed them. He then dispatched 2 technicians to deploy 6 incident data loggers to record the duration and extent of the outage.

The Network Manager drove into the office, making calls from his car to schedulers, gangs, etc. to ensure appropriate resources were in place and the appropriate authorities had been informed to allow emergency traffic management.

By this time, Customer Services had received a larger number of complaints. This triggered escalation to Director level.

The Network Director hastily co-opted an Incident Room and assembled the team.

The Standby Technician handed over to the day technician.

Discussions in the Incident Room revealed that a burst had occurred in the same area the previous afternoon. It was suggested that the cause could be the PRV malfunctioning. Another crew was despatched to assess the PRV.

The PRV assessment established that the diaphragm was damaged but the crew wasn't carrying a spare diaphragm so had to return to base to get one.

9:00AM — Pictures of the flooded road and the 1 mile traffic jam were flooding social media. Local news ran a headline about WWE Directors being flooded with bonuses (we recently paid out for a successful financial year last year) whilst WWE flooded residents. That same evening the local newspaper published a picture of the CEO's Jaguar XKR in his reserved space in the car park alongside the tailbacks on the A346.

11:30AM — The PRV was repaired by 11.30am.

1:00PM — By 1pm the mains repair and road reinstatement was completed and water restored to customers.

The total event duration was 11 hours. A total of 0.75 customer minutes were recorded. We received 758 calls. The incident made national news because a local disabled group outing was caught up in the traffic chaos resulting in an ambulance being called when one of them experienced a medical emergency.

We set up a team to review the event. It took around 1 week to collect reports from everyone involved and 1 week to review and analyse these and write up the conclusions. It took another 2 weeks to arrange a meeting to discuss and agree lessons learned. The key conclusion was that we need event management software to help us share relevant information more quickly, more coherently and more widely to assist us in conducting post-incident reviews.

An incident is an event that could lead to loss of, or disruption to, an organization's operations, services or functions and eventually result in, or, contribute to a financial penalty. There are processes relating to managing an event, to bring it to a conclusion as quickly and effectively as possible before it escalates into an emergency, crisis or a disaster. There are subsequent processes to identify, analyse, and learn lessons to prevent future re-occurrence or to improve the way in which events are managed in future.

EVENT MANAGEMENT SOFTWARE

Event management software enables companies to address these challenges effectively, ensuring that information is quickly and widely available, and that everyone is included in communications as required from wherever they are.

21st Century Water Water Everywhere (21WWE) is committed to supplying high quality drinking water, and providing an excellent service to our customers and communities. We use a suite of smart network management solutions including event management software.

PROBLEMS

There are three main problems with the way in which events are typically handled:

1. Relevant information is hard to come by because it is held in different people's heads and disparate systems, and those people and systems are in different locations
2. Keeping everyone up-to-date in every location with every action undertaken, decision made, and the rationale for each decision is difficult; and
3. Reviewing the event to learn lessons for the future is a separate and time consuming process.

Consequently:

* For large events an incident room is set up and people often have to stay late or come in to the office early or at weekends
* Smaller events are managed in an ad hoc way and may escalate into large events
* Time is lost in diagnosing and resolving events
* Activity can be missed or duplicated
* Decision making is impeded
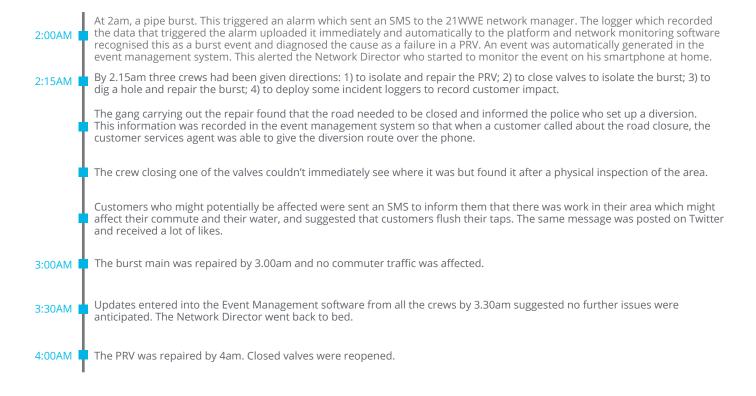* Lessons aren't learned

Therefore, in a water company context:

* More water is lost/more pollution occurs
* More customers are affected
* More penalties are imposed
* More damage occurs to reputation

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This is the worst event we've experienced this year:

2:00AM At 2am, a pipe burst. This triggered an alarm which sent an SMS to the 21WWE network manager. The logger which recorded the data that triggered the alarm uploaded it immediately and automatically to the platform and network monitoring software recognised this as a burst event and diagnosed the cause as a failure in a PRV. An event was automatically generated in the event management system. This alerted the Network Director who started to monitor the event on his smartphone at home.

2:15AM By 2.15am three crews had been given directions: 1) to isolate and repair the PRV; 2) to close valves to isolate the burst; 3) to dig a hole and repair the burst; 4) to deploy some incident loggers to record customer impact.

The gang carrying out the repair found that the road needed to be closed and informed the police who set up a diversion. This information was recorded in the event management system so that when a customer called about the road closure, the customer services agent was able to give the diversion route over the phone.

The crew closing one of the valves couldn't immediately see where it was but found it after a physical inspection of the area.

Customers who might potentially be affected were sent an SMS to inform them that there was work in their area which might affect their commute and their water, and suggested that customers flush their taps. The same message was posted on Twitter and received a lot of likes.

3:00AM The burst main was repaired by 3.00am and no commuter traffic was affected.

3:30AM Updates entered into the Event Management software from all the crews by 3.30am suggested no further issues were anticipated. The Network Director went back to bed.

4:00AM The PRV was repaired by 4am. Closed valves were reopened.

The total event duration was 2 hours. No complaints were received from customers. 0 customer minutes were recorded. There was some positive media coverage relating to the incident for the helpful messages we posted about it, criticising the electric utilities for not being so proactive.

A quick review was conducted of the event the following day using the log automatically generated by the event management system.

Only one opportunity to improve was identified: update GIS with photos and location information about the valve that was hard to find.

Fantasy? No, today a reality with i2O's suite of smart network solutions.