Drinking Water Quality Regulator for Scotland

Incident Summary

Glassford Service Reservoir
Chlorine overdose
3 October 2018

DWQR Inspector:
Moira Malcolm

Event No. 9732

Event Category: Significant

On 3 October 2018 Scottish Water (SW) Intelligent Control Centre (ICC) called out low alarms from the inlet and final chorine monitors for Glassford Service Reservoir (SR) which has secondary chlorine dosing. The Network Services Operator (NSO) attended and found that the signal from the monitoring chlorine cell to the dosing control had been lost. He requested that further alarms were suppressed as the outlet chlorine instrument was faulty and awaiting repair. The following day Network Operations conducted a planned visit to the SR and discovered that the hypochlorite dosingpumps were running at 90% output and overdosing approximately 10.5 l/hr. Dosing was stopped andSW maintenance attended site to find the signal from the chlorine cell to the dosing control was reading 0 mg/l due to an unexplained scaling error although the cell itself was reading correctly (0.7 mg/l). The signal was re-zeroed and re-scaled and the cell reading to the dosing control was restored.The SR was isolated from the network – reducing the chlorine entering supply from 2.0 mg/l to 0.5 mg/l. The SR was then scoured and de-chlorinated and refilled before it was returned to service on 10October. Chlorine readings taken in distribution on 4 October displayed 2.2 mg/l for both free and total chlorine– the highest reading available on the handheld chlorine monitor, and remained high until 5 October. Calculations by Scottish Water suggest concentrations may have reached 3.5mg/l. During the incident increased chlorine was dosed into distribution for approximately 18 hours. 11consumer contacts were received by Scottish Water from the affected distribution area.

The incident was caused by a fault with the signal from the chlorine cell to the dosing control that incorrectly indicated a zero reading. This caused the secondary chlorine dosing (which

was in Mode 2
– residual setpoint control) to dose at its maximum in order to attempt to correct what it saw as a low chlorine residual. The NSO who attended site did not understand the consequence of the lost signal and had not noticed the increase in dosing by the pump. The dosing skid had been put into Mode 2 the previous day due to a fault and ICC were not aware that the secondary dosing was residual controlled. The dosing control was set up to allow the dosing pump to run at a maximum of 90% capacity. This site uses neat sodium hypochlorite and the investigation has found that the pumps are oversized for the operation, both of which limit the control available to operators, and increase the risk of significant overdosing.

The event has been categorised as Significant. Scottish Water has identified six actions which DWQRaccepts are appropriate and will monitor to ensure they are completed prior to signing off the incident. DWQR made two additional recommendations.