

Loch Calder WTW Disinfection failure November 2020

DWQR Inspector:
Moira Malcolm

Event No. 11380

Event Category: Significant

On 17 November, Loch Calder Water Treatment Works (WTW) experienced a power failure which affected a number of pieces of equipment. As the power loss was transitory, the generator did not engage. On site operators acknowledged the tripped alarms and prepared the plant for restart. They noted that the chlorine pumps were airlocking – confirmed by reviewing the chlorine trends – and that there had been no chlorine dosing since the plant restart. No chlorine alarms had been generated. Operators attempted to escalate the issue but the Operational Team Leader was unavailable and process scientist was on leave. The Senior Operator was informed. Operators cleared the airlock in the dosing pipework and reinstated chlorine dosing, after 45 minutes without dosing. Around 40 minutes later it was noted that whilst dosing was occurring, the post chlorine contact tank (CCT) chlorine residual had fallen to 0.16mg/l. On advice from the Public Health Team (PHT) a final water sample was taken and further samples scheduled for the following day. A further loss of power several hours later resulted in another airlock which was cleared and dosing reinstated. At this time chlorine dosing dropped to 0.1mg/l for 15 minutes.

The incident was caused by an airlock in the dosing pump lines preventing chlorine dosing following a power outage. Scottish Water's investigation couldn't confirm the exact cause of this and it has been attributed to either air being drawn into the dosing pumps from the feed line or gas forming within the pumps. Scottish Water's investigation noted that there had been difficulties commissioning the new chlorine dosing skid throughout 2020, during which time the operators had become accustomed to fixing issues directly. The investigation found that the wrong de-gassing heads had been installed on the new skid, leading directly to the incident.

No alarms were triggered by the loss of dosing to alert operators of the loss of dosing. This was because the related flow switches had been installed at the incorrect setting. It is fundamental that all alarm settings are appropriate and this is thoroughly checked at commissioning of new equipment. The drop-off in the final water chlorine residual could have been mitigated by shock dosing the CCT or clear water tank (CWT), however there was a confusion in the naming convention when the operators spoke to PHT as on site operators refer to the CWT as a 'balance tank'. The lack of personnel available when operators attempted to escalate the onsite issues may also have contributed to the omission of shock dosing. Loch Calder WTW has no run to waste facility to remove non-compliant water before it enters distribution. This was raised following a previous event (action 4139).

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

