

Loch Calder WTW Loss of Disinfection 10th January 2024

Event No. 14108

Event Category: Significant

On 10th January 2024, planned work was carried out on the chlorine dosing skids by one of Scottish Water's delivery alliance partners and contractors. In order to replace the pipework on chlorine dosing skid B, the contractor closed the 'carrier water B' isolation valve, which resulted in the carrier water flow to both dosing skids over pressurising. This triggered the site auto-shutdown system (due to low chlorine dose), however, some forward flow of water continued which did not receive an appropriate chlorine dose. With the works shutdown, the contractor replaced a non-return valve (NRV) on dosing skid B with a ball valve, which was in turn isolated so that carrier water B isolation valve could be reopened and pressure returned to normal whilst work progressed on dosing skid B.

The plant was restarted and work was completed on dosing skid B before the contractors moved to begin work to replace pipework on dosing skid A. The duty skid was changed to dosing skid B, however the skid failed to dose chlorine as the automated purge function on the dosing pump failed to stop, likely due to back pressure from the carrier water after the NRV had been removed and not reinstated on dosing skid B. On this second loss of disinfection, the works did not auto-shutdown on low dosed chlorine as an inhibit had been left in place following the first disinfection loss. Dosing was restored when the duty pump was changed back to pump A.

Throughout both events, inadequate disinfection occurred for a period of approximately 90 minutes with post contact tank chlorine concentrations reducing to 0.25mg/l and 0.55mg/l respectively, whilst final water chlorine dropped to a low of 0.78mg/l, below the sites

Emergency Action Level (EAL), for 20 minutes. This impacted approximately 0.42 Megalitres of water. Samples taken from the final water and three downstream reservoirs on the 10th and 11th January being microbiologically satisfactory.

The root cause of this incident was a failure to understand the operating configuration of the chlorine dosing skids (both carrier water lines continually flushing), resulting in an incorrect RAMS (Risk Assessment Method Statement). This was compounded by a number of contributing factors including:

- Ineffective auto-shutdown arrangements which permitted a forward flow of water;
- Inadequate management of the RAMS process which allowed work to proceed despite a lack of treatment control approval;
 - A failure to provide the necessary supervision to ensure compliance with the methodology (or approval for deviation);
- Serious deficiencies in monitoring and communication during the planned work which resulted in a failure to identify the loss of disinfection.

The event has been categorised as significant. Scottish Water has identified seven 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.

