Drinking Water Quality Regulator for Scotland

Incident Summary

Herricks WTW
Loss of Disinfection
14th September

DWQR Inspector:
William Byers

Event No. 12058

Event Category: Significant

On 14th September, the disinfection dosing system ceased to deliver the chlorine solution into the treated water. Intermittent erratic dosing had been occurring and becoming more pronounced over the preceding two months and one of the dosing pumps was found to be performing poorly, Pump X. A decision had been taken to stop the automatic daily switching of duty between the two pumps and to run with the good pump, Pump Y. The ability to automatically change duty in the event of a failure with pump Y was retained but an inhibit was placed on the automatic shutdown of the works should pump X come into service, to avoid process alarms arising from any erratic dosing performance. On the day in question, dosing line Y failed to deliver disinfecting solution at 2:45am but because the pump continued to run, the switch over to pump X was not triggered. Due to the plant shut down being inhibited, the treatment works continued to operate. A further alarm on the level of chlorine in the dosed water, was logged by instrumentation but failed to be transmitted by the telemetry outstation to the Control Centre. It was only as the reduced level of chlorine in the water was detected on the outlet from the disinfection contact tank that alarms there were triggered, which activated the works full shut down at 4:42am. Operators were subsequently alerted, attended the site and after resetting the disinfection process, returned the works to service at 5:45am. These failures permitted undisinfected water to pass forward through the works into the clear water storage tank. Throughout the event and in subsequent days, samples taken on the final water from the works and in the distribution system showed no failures of microbiological standards

Scottish Water's investigations found the failure of dosing of disinfection solution to have been caused by an air lock in the chlorine dosing pump which prevented the forward passage of solution, even though the pump remained running. The problem could have been responded to earlier, had the auto shut down associated with low chlorine content at the pre contact tank monitoring not been disabled and had the second alarm point operated, as was its function. Both of which are likely to have prevented the consequential loss of disinfection. It is fortunate that an alarm further through the treatment processes did operate to alert staff and allow a response to be made. It is however a serious concern that safeguards can be disabled to avoid 'troublesome' alarms being generated and the situation be permitted to endure for lengthy periods of time. This places an unacceptable risk of poor quality or unwholesome water being produced and transmitted to consumers. In this instance although discussions had taken place with both the Team Leader and the Control Centre on the disabling of the auto shut down facility, this had not been followed up within the formal Critical Equipment Removal Process (CERPS) which may have given more visibility of the continuing risks to treatment at the site.

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