

## Rosebery WTW Power and PLC Failures 27<sup>th</sup> November 2021

DWQR Inspector:  
Moira Malcolm

Event No. 12267

### Event Category: **Serious**

On 27<sup>th</sup> November the standby operator was called out to Rosebery WTW for a rapid gravity filtration (RGF) alarm. On attending they found that the Programmable Logic Control (PLC) was in fault and water had been flowing forward through the treatment works with no treatment or disinfection dosing for 4 hours. The operator successfully rectified the plant by resetting the PLC causing an auto shutdown, washing and reinstating the filters and shock dosing the chlorine control tank (CCT) and clear water tanks before restarting the works. Reactive sampling revealed a *Cryptosporidium* detection at the final water sample point and one manganese failure in distribution.

On 7<sup>th</sup> December the standby operator was called out for a standby generator failure. This time the raw water inlet valves had closed effectively, but chlorine dosing had failed. The operator returned the site to mains power, shock dosed the CCT and attended to the Dissolved Air Flotation units (DAF) and filters until they returned to normal. The chlorine monitor was in fault so the operator took bench samples until it was repaired. A *Cryptosporidium* oocyst was detected in the final water failure following this event.

On 14<sup>th</sup> December the ICC called out another RGF plant failure. The standby operator discovered that again the master PLC was in fault and the WTW inlet valves were open with no chemical dosing for approx. 3½ hours. The operator cleared the PLC fault, dumped the filters to waste and recovered the plant, as before: shock dosing the CCT and attending to the DAF and filters until they returned to within normal limits with all chemical dosing restored. On this occasion all reactive sampling was compliant.

Scottish Water's investigation concluded that the incident was caused by the PLC failure, due to the master PLC being overloaded and incorrectly configured so that the inlet PLC was overridden so didn't fail to safe and close the inlet when the master PLC failed.

This incident highlights the importance of PLCs on the entire treatment process, and the need for these to be used within capacity, with this being checked before new signals are added to existing PLCs. Master PLCs, where present, must be configured to ensure their failure would not mitigate the functioning of other PLCs.

The volume of alarms being received by the ICC on the night of the first failure (during Storm Arwen) contributed to the duration of the first event as because the first alarm was not noted or called out. The storm itself is not thought to have contributed to the PLC failure.

The event has been categorised as serious. 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 two additional recommendations.



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