

Incident Summary

Spey Badentinan WTW Chloramination process failure 29 October 2018

DWQR Inspector:
William Byers

Event No. 9821

Event Category: Significant

Failure of the ammonia dosing system occurred at 6:00pm on 29th October due to a fault with the dosing pump. The standby dosing pump was brought online through the timed switch over of duty at 6:00pm the following evening and dosing recommenced. This then operated as normal for the next 24 hours until again at 6:00pm, the timed switch over changed duty to the non-working pump. This situation persisted for four days before operators became alert to the problem and identified the cause. The ammonia monitor is located on the outlet of the clear water tank and the buffering provided by the large volume of stored water provides a 20 hour delay in any effect and a muted picture of change in ammonia. In their fault finding, there was no obvious indication of any step change in dosing. In addition, bench tests on ammonia levels required in the task schedule were carried out at the time the working dosing pump was operating and showed normal levels within the produced water. It transpired too that the Free Chlorine monitor, which would have clearly shown the picture, was defective, flatlining with a reading near zero. During the event, the SCADA screen had frozen on 1st November and it was on the restart of the system and the coincidence with the failed pump being assigned to duty and showing no flow, that the issue became clear. Temporary switch over to the operable pump allowed investigations to be carried out and this determined an error in a maintenance visit on 29th October which left the pump in 'pause' mode. In this state, it would not respond to timer signals and no alarms would be transmitted to alert operators.

It is clear that the root cause of this incident was the failure to ensure the operability of the dosing pumps following the maintenance of the equipment. Scottish Water advise that whilst there are reporting and checking procedures where external maintenance contractors carry out work on plant and equipment and there are checks carried out, this is not necessarily done when in-house maintenance teams are utilised. This is an unacceptable gap in maintenance procedures that must be addressed.

Ammonia is added to the water after the primary disinfection stage to produce monochloramine as a means of ensuring a persisting disinfection of the supply and reduce the potential for the formation of THMs throughout the extensive distribution system. I am satisfied the primary disinfection process was not affected by this incident. Sampling was carried out in the distribution system and at consumers taps over the following days to monitor the impact of the interruption in the ammonia dosing. The results showed no failures of THM or microbiological standards.

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 three additional recommendations.

