

Incident Assessment

Lochaline WTW, Lochaber Disinfection Failure August 2011

DWQR Inspector:
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Details of Incident

On 21 August, a leak on a chlorine dosing line caused chlorine concentrations to drop, although some chlorine remained in the system. The operator was called out due to an alarm relating to the leak, not due to low chlorine in the final water. The line was repaired and additional chlorine added to the clear water tank.

The following day, it was noticed that chlorine concentrations in the supply were again low. Once again, no alarms for low chlorine had been received. The works should have shut down due to low chlorine concentrations but did not do so. This time dosing lines and loading valves were cleaned, which seems to have resolved the problem.

DWQR Assessment of Cause of Incident

The root cause of the incident was a faulty chlorine dosing line, but systems in place to alert staff and protect consumers failed to operate correctly on both occasions. Final water chlorine concentrations did not drop away to zero, however the disinfection process was undoubtedly compromised. No alarms had been received because valves controlling the flow to pre- and post- contact tank chlorine instruments were closed. It is not clear why, nor why this did not in itself trigger an alarm. Once the valves were opened all instrumentation and alarms operated correctly.

Scottish Water investigated the failure of the low chlorine shutdown. It was found that the system had defaulted to manual operation, bypassing the automatic shutdown process. The following day, Scottish Water thoroughly investigated and tested the chlorine monitoring and shutdown system. With the plant operating in automatic mode, all alarms and shutdowns functioned correctly.

DWQR finds it concerning that this issue was allowed to occur in the first place, and that the loss of flow to chlorine instrumentation was not spotted after the initial problem with a burst dosing line. A number of unanswered questions remain around this incident. DWQR expects Scottish Water to ensure that all chlorine monitoring instrumentation and shutdowns are operating correctly and are regularly tested to confirm this.

DWQR Assessment of Actions Taken by Scottish Water

Actions to Protect Consumers

The disinfection process didn't fail completely, and at no time was there a complete absence of chlorine in water supplied to consumers. Scottish Water staff acted to top up the chlorine by dosing into the clear water tank.



Actions to Confirm the Quality of Water Supplied

Scottish Water took a number of microbiological samples from the treatment works and, after the second problem on 22 August, at two locations in this very small water supply zone. DWQR considers this adequate except that samples should also have been taken from the distribution system following the first problem on 21 August.

Actions to Restore Water Quality

Chlorination was restored rapidly on both occasions, but on the first occasion it was not noticed that there was no flow to the chlorine instrumentation. Once this was rectified, the plant began to operate correctly in automatic mode.

DWQR is of the opinion that this “near miss” incident should not have been allowed to occur and that it could have been resolved much more quickly. Scottish Water has wisely installed a final water chlorine monitor as the site did not previously have chlorine monitoring equipment after the clear water tank at this site.

