



Drinking Water Quality Regulator
for Scotland

Incident Assessment

Bonchester WTW – Disinfection Failure 25 February 2011

DWQR Inspector:
Matthew Bower

Summary of Incident

A new chlorination system was installed at this small site in the Borders. During installation, this new system was inadvertently left on an incorrect setting, which caused chlorine dosing pumps to shut down. Due to confusion over instructions given to Scottish Water's Intelligent Control Centre (ICC), no low chlorine alarms were called out to the operator, consequently the disinfection failure was not discovered for two days until a member of staff noticed the problem via telemetry. Once the issue was discovered, chlorination was quickly restored and the system was flushed to pull it through the distribution pipework. All microbiological samples taken during the incident were negative.

DWQR Assessment of Cause of Incident

This incident was unacceptable on two levels- firstly that the failure of the chlorination system occurred at all, secondly that the issue was not discovered and resolved promptly.

Scottish Water and the contractor had failed to spot that an inbuilt factory setting on the new chlorinator had not been disabled. It was this setting which shut down the system, and it is concerning that the commissioning process hadn't identified and removed this risk. Scottish Water has correctly identified an action to fully test all similar chlorine controllers during commissioning – it is of concern to learn that this wasn't consistently happening already.

Understandably, the installation and commissioning of the system generated a number of false alarms, and the ICC were advised to ignore these, however when a genuine low chlorine alarm occurred, confusion over these instructions and staff shift changes meant that no local staff were called out.

DWQR Assessment of Actions Taken by Scottish Water

As is usually the case in such circumstances, once local staff were alerted to the problem the response was swift and appropriate. Full chlorination was restored to the site within two hours of the problem being detected, although DWQR notes that the standby operator was 90 minutes away from the site when the call came in, raising the question as to whether local standby coverage in the area is adequate.

Scottish Water is of the opinion that there was some chlorine in the system due the presence of a slow-release chlorine tablet that staff routinely place in the spring inlet, however it is not clear why, if this was the case, final water chlorine residuals recorded by instrumentation fell away to zero. Fortunately, all microbiological samples were clear, meaning that it is likely that there was no risk to public health.

Action Number	Action Description	Action Owner	Action Completion Date
1	Remove the low chlorine pump shutdown	Contractor	Complete
2	Configure emergency dosing system to commence dosing on low chlorine	Contractor	Complete
3	Investigate ICC failure to pass out low chlorine alarm	ICC Manager	Complete
4	Fully test all new installations with multi-function controllers and confirm alarms and shutdowns operate as required in the South region	Water Operations Manager	Complete
5	Review and update Water Safety Plan	Asset Planner	Complete
6	Circulate incident report to all Water Operations Managers, highlighting the identified risk around multifunctional chlorination / dechlorination controllers	Water Operations Manager	Complete

DWQR is content with the actions proposed by Scottish Water, with the proviso that appropriate action in the form of updated procedures and working practices in the ICC are introduced should the investigation conclude that these would be beneficial.