Drinking Water Quality Regulator for Scotland

Incident Assessment

Kaim WTW
Coagulation Failure
13 December 2011

DWQR Inspector:
William Byers

Summary of Incident

On 13 December, a problem in the lime dosing preparation plant caused a failure in the coagulation process leading to high Aluminium levels in the final water. The operator arrived on site at 0800hrs and noticed a problem with the lime dosing process. This was not investigated until later in the morning when a blockage in the lime screw conveyor was found. The standby lime conveyor also failed leading to loss of lime dosing. Following escalation of the situation to the Team Leader, the plant was shutdown in order to assess the situation and to carry out repairs to the lime plant. The plant was restarted at midnight and Aluminium residuals returned below PCV by 0300 hrs. Over the following night, 14/15 December, the standby operator was called out for high filtered Aluminium alarm, which occurred at 2215 hrs. On attending site, the operator found that the coagulation pH had in fact been low but due to a faulty pH probe, this had not been detected. The operator stabilised the plant again but the final water Aluminium residuals had again increased above the standard. Production of compliant water was restored by 0800 hrs on 15 December.

DWQR Assessment of Cause of Incident

There were two distinct coagulation events spanning a period of three days. Initially, a failure of the lime screw conveyors affected the coagulation chemistry and the failure of the coagulation process. The second event was caused by a faulty pH probe, which again brought about loss of control in the process. Delays occurred in the escalation of the problems within Scottish Water and in attending to alarms, which extended the period when non-compliant water was being produced.

DWQR Assessment of Actions Taken by Scottish Water

DWQR considers the delays in responding to the developing situation to be unacceptable. There was a failure to recognise the severity of the initial lime dosing problems and to escalate awareness of the situation within the company. In the second instance, greater vigilance to the process problems and the implications of any alarms could have been expected throughout the teams, given the failures the previous day. Scottish Water carried out a formal investigation into the response to both events to ascertain whether a breach of procedures occurred. The company also carried out a review of their Control Centre procedure for dealing with coagulation events.

Scottish Water has identified a number of actions from this incident. DWQR accepts that these are appropriate and will be monitoring to ensure they are completed prior to signing off the incident.