Drinking Water Quality Regulator for Scotland

Incident Assessment

Bradan WTW Treatment Failure 28 June 2013

DWQR Inspector:
William Byers

Event No. 5395

Event Category: Significant

Summary of Incident

On 28 June 2013, the power supply to Bradan Water Treatment Works failed causing the emergency power generators to start up. There are two generators at this works that power different parts of the treatment process and whilst generator No 2 came on line and powered the disinfection process, No 1 generator did not switch across and chemical dosing and monitoring ceased to operate. Telemetry from the site remained in service and alerted the control centre to the power failure and a standby operator attended the site within 40 minutes. The operator quickly established there was a problem with the switching of the power breaker and recognising the flow would not be treated properly for disinfection, he activated the back-up chlorination equipment to ensure the final supply water had a sufficient level of chlorine as it entered the distribution system.

Investigation of the problem found that the breaker had not closed and after carrying out a manual re-set, the power from generator 1 was able to be brought on line. The power outage lasted 2 hours.
Following restoration of power to the treatment processes, the operator carried out washing of the filters and took a series of samples from the process to ensure everything had returned to normal operation. Although the inter-stage turbidity remained significantly above normal for a period of almost 6 hours, all sampling of final water quality and the supply in distribution was shown to be within the standards.

DWQR Assessment of Cause of Incident

DWQR declared this event an incident due to the loss of control over the treatment process preparing the water for final disinfection. Normally, power to the breaker is maintained through hydraulic turbines, driven by the inlet flow to the works, maintaining a charge. Scottish Water has carried out an investigation of the problem and found that the failure to trip the breaker was a consequence of a health and safety event at the works at the beginning of June when a fault occurred with the back-up batteries to the hydraulic turbines causing two batteries to explode. The facility was off-line pending a safety review of the arrangement. Maintenance work on the high voltage power at the works had then required the turbines to be stopped and it was during this period that the external power supply to the site failed.

DWQR Assessment of Actions Taken by Scottish Water

DWQR is satisfied that Scottish Water standby staff were quickly in attendance to this alarm and that appropriate action was taken to address the problems encountered.

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Scottish Water has since installed an Uninterruptable Power Supply (UPS) for the turbine to replace the obsolete battery arrangement and made provision in the control panel for an alarm and switch for manual operation, if a similar loss of energy to the emergency power breaker was to occur again.

The event has been categorised as significant. Scottish Water has identified a number of actions and DWQR accepts that these are appropriate and will be monitoring to ensure they are completed prior to signing off the incident.