

TGN10 - EVENT AND INCIDENT MANAGEMENT

Introduction

Water undertakers should ensure that they have management procedures in place for the handling of events and incidents that have or have the potential to affect drinking water quality. The processes for responding to events and incidents have developed considerably through the capture of experience over the last 10 years. Management procedures should be established within a water safety plan framework and should not be restricted to those situations that may have a direct effect on human health. In general the term 'incident' is used for more serious events either because of the nature of water quality risk or its extent, for example the number of customers affected. In the context of this document, these are all referred to as 'events'. Differentiation should be made between microbiological contamination such as the detection of *E. coli* and chemical events such as a contamination due to hydrocarbons because there are distinctive factors to an effective response. The potential for malicious contamination should also be considered.

These procedures should be underpinned by a thorough understanding of supply systems and, wherever practical, by established and tested water resource contingency plans.

The Drinking Water Inspectorate has provided guidance on the type of event that they expect to be notified. By their nature all events and incidents are different to some degree or other. The following Good Practice is provided as guidance on general principles for the more common types of occurrence.

Good Practice

1. The building of relationships with health and local authorities through liaison meetings and regular contact is essential for effective communication during an event.
2. Up to date contact lists with health professionals and other stakeholder organisations must be maintained and should include arrangements for out of hours contact where appropriate.
3. Water undertakers should ensure that these key stakeholders have an understanding of the main public health risks identified from their Drinking Water Safety Plans and the control measures that are in place.
4. As part of liaison with Local Authorities and Health Protection Units it is advisable to establish the trigger values (or other escalation criteria) for certain chemical and microbiological monitoring parameters, customer contacts and other intelligence that would lead to declaration of an event/incident and notification being made. These could take the form of a value for a parameter, for example a particular pesticide, the presence of *Cryptosporidium*, or number of customer contacts for discoloured water received in a 24 hour period.
5. Water undertakers should have procedures in place detailing the investigative steps and actions required following exceedences of PCVs; these should include the sampling requirements in terms of locations and minimum numbers of samples, analysis required and reporting timescales for results.
6. Incident Management / Outbreak Control Plans, developed and agreed in consultation with local health authorities and environmental health professionals, should be in place and should be exercised periodically.

7. When circumstances require that precautionary advice is given to customers placing restrictions on water usage (unless this advice is to a single property according to a pre-established procedure) these must be issued after consultation with the relevant health and local authorities. The criteria for withdrawing any restrictions to water use must also be identified and agreed early in the event management process.
8. In general, precautionary advice can involve the following restrictions to water use:
 - a. Boil Water for Drinking
 - b. Do Not Drink Water
 - c. Do Not Use Water.
9. All such advice to customers must be issued by the water undertaker who remains responsible for its implications and management throughout the incident. There should be clear criteria agreed at the outset when issuing such advice to customers regarding the lifting of such notices.
10. To ensure that all potentially affected customers are notified as quickly as practicable of any restrictions to water use, the following or equivalent arrangements should be available:
 - a. Use of pre-prepared warning cards for each restriction, and where necessary standard letters for customers affected. Arrangements should be in place for rapid delivery of any warning cards and/or letters (e.g. walk plans for areas, arrangements with external contractors/Royal Mail). Delivery of warning cards should be capable of being achieved within 36 hours of the decision being taken to issue.
 - b. Use of local media; press statements can be pre-prepared for each of the above restrictions, and locations affected added at the time of the event. Media announcements should be made where the delivery of warning notices cannot be achieved within the same working day. The issuing of joint press statements with other stakeholders should be considered and where Incident Management or Outbreak Control Teams are convened is strongly advised.
 - c. Development of Question & Answer sheets for each of the above scenarios and ensuring that these are quickly made available to company call centres, scientific and operational teams.
 - d. Use of company websites to display information relating to the event / incident.
 - e. For smaller incidents, door-to-door notification, or use of loud-hailers on vans may be used in advance of the arrival of a warning card/letter.
 - f. Consideration should be given where appropriate to provision of advisory information in languages other than English and in Braille.
11. In practice reliance should not be placed on any single method and consideration should be given to using a combination of the above to ensure that all customers are informed.
12. Lists of 'vulnerable' customers should be maintained and special care and attention provided to these during events. Customers receiving renal dialysis should be prioritised and local dialysis centres contacted. Liaison with local health authorities should establish what assistance would be necessary to ensure these customers are appropriately provided for.

13. Customers who are immuno-compromised are routinely advised to boil water for drinking and precautionary advice or provision of alternative supplies during a potential incident does not alter this position.
14. Special consideration should also be given to businesses, such as food manufacturers, in the affected area for whom water quality might be critical.
15. Liaison arrangements should also be in place with other organisations such as the Environment Agency, British Soft Drinks Association, European Point of Use Drinking Water Association and Chilled Food Association, along with neighbouring water companies with bulk import or export agreements. In some cases it may be appropriate to consider liaison with the Food Standards Agency. Reference should be made to the Water UK protocols agreed with some of these organisations for use in emergency situations.
16. Consideration should be given to the nature and extent of publicity at an early stage. In a multi-agency incident it is very important to ensure that press statements are made by joint agreement with health and local authorities (or other appropriate agency) to ensure that a consistent and reliable message is communicated.
17. The following general principles apply to the resolution of events
 - Have the criteria agreed at the outset for the withdrawal of advice notices to customers been satisfied? These decisions should be informed from an appropriate monitoring programme and should involve wider understanding of the system to define the extent of the event.
 - Every effort should be made to find the root cause and this should be verified after remedial action has been implemented.
 - Where no root-cause can be identified, or where a cause is only tentatively identified, it may be prudent to carry out further investigation and monitoring to obtain additional information and confidence.
 - Information from the event should be used to update the Drinking Water Safety Plan taking account of hazardous events and control measures identified.

Microbiological events

1. Following detection of microbiological contamination in treated water and following suspected ingress of surface water, soil or sewage, customers should, as a minimum, be advised to boil water for drinking. For events where sewage ingress is implicated, and the sewage may contain industrial waste including chemicals, a risk assessment should be performed before deciding what precautionary advice is appropriate. The decision to issue this precautionary advice should be taken following consultation with the health and local authorities. The good practice outlined above in terms of customer notification should be followed.
2. Where practicable and without compromising public health, prior to any remedial chlorination, samples should be taken from the affected area, along with upstream areas for comparison. Following such chlorination, and the return of chlorine residuals to normal concentrations, a sample survey should be undertaken in the affected area (along with upstream locations) to confirm the effectiveness of the chlorination. These samples should be analysed for coliforms and *E. coli*. Depending on the nature of the contamination consideration should be given to sampling for other parameters such as Cryptosporidium.

3. Where appropriate, the concentration of chlorine in the area affected should be increased for example by controlled dosing of sodium hypochlorite. In some circumstances, such as in order to disinfect a discrete section of the distribution system, the use of, for example, 50 mgCl/l (free residual) held for 30 minutes standing may be necessary. If possible the stop-taps at boundary boxes should be isolated prior to disinfection of the main, otherwise customers in areas where high-level chlorination is being undertaken should be warned and an appropriate restriction to water use imposed (usually “Do Not Use”). At the end of the chlorination period, the distribution system should be flushed until the chlorine concentration has returned to normal levels. Any discharges of highly chlorinated water must be neutralised and strictly controlled to prevent environmental damage.
4. In other circumstances, such as where low levels of coliform bacteria (in the absence of other faecal indicators) are detected, increasing the chlorine concentration, for example to between 0.5 and 2 mg/l for a longer period of time, may be more appropriate. This could involve increasing the concentration of free chlorine leaving the water treatment works or storage point to or boosting the chlorine in a part of the distribution system using portable chlorination equipment. A typical application time for such booster chlorination to be effective could be 12-24 hours, and where deemed necessary, the distribution system should then be flushed until the chlorine residuals are normal for the area.
5. For the quality of the water to be considered satisfactory after such an event a second set of samples should be taken from locations defining the extent of the contamination as well as the original locations at a time after the first set taking into account the turnover of the system but usually not less than 12 hours later, and should be negative for indicator bacteria after analysis for the parameters identified above.
6. The advice to boil water for drinking may be withdrawn in consultation with health and local authorities provided that the criteria agreed at the beginning of the event have been satisfied.

Non-microbiological events

1. The actions to be taken during an event involving chemical parameters depend very much on the parameter involved.
2. Events affecting the aesthetic quality, appearance, taste and odour, of the water are generally first identified from customer contacts. Appropriate procedures should be in place to alert operations, customer services and water quality management departments.
3. For events involving aesthetic parameters, provided that there is no risk to human health no restrictions to water use may be necessary, although it may be advisable to give advice to the customer service department on responding to such issues. In the case of iron and manganese related events, flushing or air-scouring of the distribution system, if deemed appropriate, may be sufficient to alleviate the problem. The nature and extent of the problem should be identified through undertaking sample surveys in the affected and wider area. Whenever practicable contemporaneous samples should be taken during the event and must be taken afterwards to verify the effectiveness of any remedial action.
4. For events involving chemical parameters posing a potential risk to public health, such as hydrocarbons, restrictions to water use may be required dependant on the concentrations

of the parameter involved. Toxicity data should be used to inform the process of making such a decision and the nature of any restriction or advice to customers being considered should be discussed with the health and local authorities prior to implementation. The remedial action required will also be dependent on the parameters involved; it is good practice to have procedures in place to detail actions required for a variety of chemical events.

5. Depending on the nature of the contamination and the risk assessment, a single set of samples may be sufficient to demonstrate that levels are within acceptable limits. However in general, for the quality of the water to be considered satisfactory after a chemical contamination event, a number of sets of samples, taken from locations defining the extent of the contamination, at least 12 hours apart, taking the turnover of the system into account, should demonstrate that results are within acceptable limits.
6. Advice to customers about restricting the use of the water may be withdrawn in consultation with the health and local authorities provided that the criteria agreed at the beginning of the event have been satisfied.