www.legionellacontrol.org.uk

Wednesday 13th May 2020

Legionella Control Association
KEEPING WATER SYSTEMS SAFE

LCA Guidance for Members on Reopening Buildings

There are many guidance documents circulating that give guidance on how to reopen buildings and recommission water systems following a vacant period due to COVID-19. No guidance is going to be suitable for every circumstance and UK Law requires each situation to be risk assessed, and appropriate measures taken. This guidance is intended to help LCA members involved in that risk assessment process. This guidance is for hot and cold water systems only.

Simply reopening a building that has stood idle, without addressing the safety of its water system is unacceptable. If dutyholders are not able to put in place a proper recommissioning process to use the water system safely, they should not reopen the building. In addition to legionella risk, drinking water retained within buildings may no longer be potable following a period of prolonged stagnation.

Buildings that have remained empty with static water systems, or those that have been subject to limited flushing that does not represent normal usage, will require recommissioning. Those that have remained in normal use or where flushing has approximated normal usage (evidenced by water meter readings) may still require additional control measures.

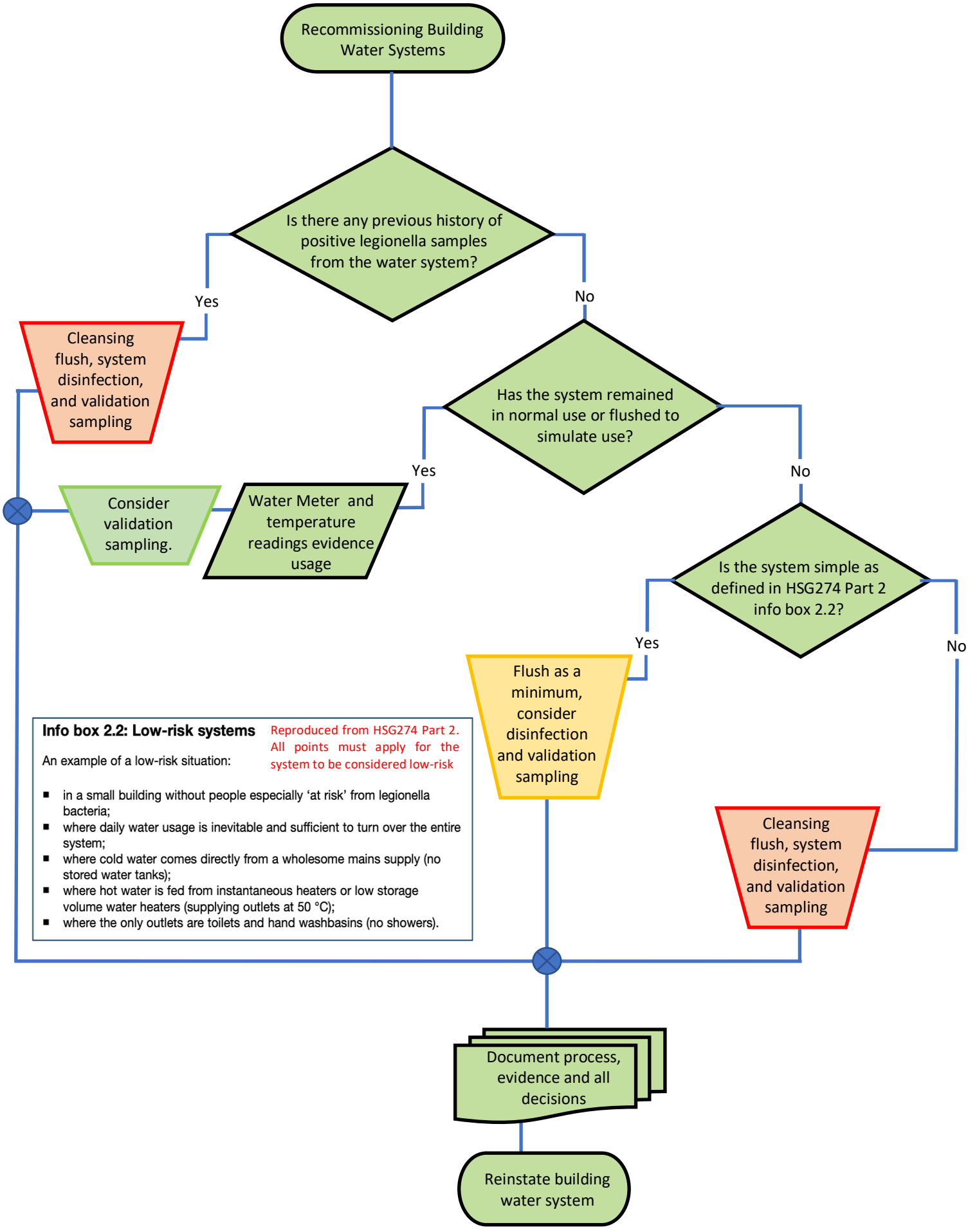
Recommissioning a building water system can be at various levels of intervention and the level of work and investment should be appropriate for the risk. For very simple buildings flushing alone may be sufficient but for most buildings some form of disinfection is likely to be needed. In the worst cases, repeat disinfection and extensive cleansing flushing may be required to clear contamination.

During the COVID-19 period there may have been a number of factors that will increase both legionella risk in water systems and the risk of legionellosis. These need to be considered in the risk assessment process:

- Rushed planning for the shutdown, possibly a shortage of staff
    - Sub-optimal decisions on building closure
    - Lack of resource to maintain buildings while they are closed
- Stagnation
    - Bacterial growth
    - Degradation of system components and build-up of by-products of that degradation – particularly where oxidising biocides are continually dosed
- Temperature increase within the building – facilitates bacterial growth and accelerates degradation of components
    - Circulating HWS leading to thermal gain in the CWS
    - Heating systems leading to thermal gain in the CWS
    - General thermal gain particularly in buildings with glass walls or a high percentage of windows and air conditioning switched off
- Temperature increase in the water network – less use in non-residential areas (e.g. office parks) has led to some increase in the network temperature locally
    - Potentially flushing was less effective than the water meter readings may indicate
    - More difficult to maintain <20°C within buildings
- Stand-alone or non-water system items may not have been considered during shut down
    - Ultrasonic humidifiers filled from the cold water outlets
    - Point of use water dispensers
    - Vending machines
- COVID-19 increases risk of legionellosis as a secondary infection
    - Consider susceptibility for legionellosis before staff return

Decision Making Flow Chart for Water System Recommissioning

Legionella Control Association
KEEPING WATER SYSTEMS SAFE



Info box 2.2: Low-risk systems

Reproduced from HSG274 Part 2. All points must apply for the system to be considered low-risk

An example of a low-risk situation:

- in a small building without people especially 'at risk' from legionella bacteria;
- where daily water usage is inevitable and sufficient to turn over the entire system;
- where cold water comes directly from a wholesome mains supply (no stored water tanks);
- where hot water is fed from instantaneous heaters or low storage volume water heaters (supplying outlets at 50 °C);
- where the only outlets are toilets and hand washbasins (no showers).

Legionella Control Association
KEEPING WATER SYSTEMS SAFE

Risk to Operators During Recommissioning

Water systems that have been stagnant for some time will present a greater risk to staff engaged in flushing, disinfection and other work involved in recommissioning. Care should be taken to minimise exposure aerosol and the elevated risk should be considered in task risk assessments.

System Flushing

Flushing a water system will change the bulk water and, depending on flow velocity, may have a shearing effect on biofilm and move other contaminants through the system. Flow velocity is likely to be reduced by outlet fittings and flow restrictors. These will reduce the effectiveness of flushing and consideration should be given to temporarily removing these during the process.

BSI document PD855468 differentiates between hygiene flushing (to prevent stagnation) and cleansing flushing (to remove debris or organic matter) and it is important to include cleansing flushing as part of the recommissioning process rather than hygiene flushing. All valves should be operated in the fully open position so that any particulate matter can be flushed from the supply pipe. Of particular importance are float-operated or other restrictive valves which need to be induced to fully open to ensure clearing of particulates and prevent fouling of the valve. Where a clearing velocity cannot be achieved, consideration should be given to removal of valves to enable the cleansing flush.

Cleansing flushing for recommissioning needs to be a considered process and is likely to be more involved than simple hygiene flushing to prevent stagnation.

Individual risk assessment must determine control measures required but for low risk systems, as defined in HSG274 Part 2 info box 2.2, a cleansing flush may be sufficient to allow recommissioning of the system. Some systems may be close to the definition of a low risk system and operators may choose flushing as a control measure based on their risk assessment.

Flushing stagnant water from a system will always be needed as an absolute minimum control measure. More complex systems are likely to need further control measures such as disinfection.

System Disinfection

Disinfection of a water system can be achieved thermally (normally hot water systems only) or chemically. There is good guidance on this process in HSG274 Part 2 2.126-2.137 but note, the reference to BS8558 is no longer current. Readers should now refer to guidance in BSI PD855468 for flushing and disinfection.

After a period of prolonged stagnation it is not uncommon for a single disinfection to be unsuccessful and the process may need to be repeated. When scoping this type of service it is important to agree the process, and not to guarantee the result. Some areas may require more attention during disinfection and maintaining a slow flow of disinfectant over these areas for the full contact time may improve the chances of success. Areas with flexible hoses or tap tails, sections downstream of TMVs or mixer taps or other problem areas may benefit from this process.

It may be helpful to flush the stagnant water from system prior to commencing the disinfection, to remove bulk contamination and reduce the likely demand on the disinfectant. Draining and refilling storage tanks (if present) may speed this process.

Validation Sampling

To provide evidence and reassurance that the system is safe to use, validation sampling can be useful after actions such as cleansing flushing and disinfection. Samples should not be taken immediately after disinfection to avoid false negatives. Samples should be taken 2-7 days after disinfection.

Sample locations and sampling methodology should be carefully considered and documented in a sampling plan. Taking samples from sentinel and representative high risk areas would be an expected minimum but the sample plan should address any areas of the water system that are of concern.

Sample methodology needs to be considered to ensure samples give a representative answer to the question being asked. i.e. sentinel and representative points would be expected to be post-flush, removal of tap inserts, outlet disinfection samples to inform on the condition of the bulk water of the system. High risk outlets such as showers would be expected to be pre-flush without disinfection to inform on the risk at these outlets.

Samples should be analysed for legionella without focussing on specific species or serogroup. The guidance from HSE does differentiate based on species and sample analysis should match the guidance. Rapid techniques that cover all species of legionella may be useful where buildings need to be opened quickly. PCR, at species level, may be useful for this with its reliable negative predictive indication.

While waiting for sample results measures such as hygiene flushing should be undertaken to prevent degradation of the water quality.

Short Term Protection Measures

If buildings must reopen before the water system can be safely recommissioned then consideration should be given to supplementary measures to control risk. Point of use sterilising grade filters can be a useful short term measure to reduce risk in individual areas. Care should be taken in their selection to ensure there is sufficient pressure to give good flow at the outlet. Poor flow can result in users removing the filter and exposure to potentially contaminated water.

Filters will not remove dissolved contaminants, such as metals in solution from corrosion or leached chemicals from plumbing materials. Drinking water areas may still need to be flushed to reduce these to an acceptable level.

Long Term Measures

If susceptibility of those exposed to the water system has increased due to COVID-19 (or if more information comes to light from COVOD-19 precautions) the legionella risk assessment should be reviewed. If necessary, the risk assessment should be updated, the written scheme reviewed and risks addressed.

Written schemes of control for legionella should always have included start-up and shut-down procedures for water systems. COVID-19 has highlighted that many schemes do not include this or that the process is unworkable or unsuitable. Written schemes of control should be reviewed to ensure any future emergency shutdown of a building includes safe decommissioning and recommissioning of the water systems.