Environmental Safety Technologies, Inc.

INSTRUCTIONS FOR COOLING TOWER REMEDIAL DISINFECTION OF *LEGIONELLA*

(Note: For emergency disinfections of cooling towers related to cases of Legionnaire's disease, see the ***Instructions for Cooling Tower Emergency Disinfection*** in a separate document)

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1. When a decision has been made to carry-out a remedial disinfection of a cooling tower, based on test results showing elevated numbers of *Legionella* in the cooling tower water as defined in the Water Management Program, the make-up water to the tower should be increased for a few hours in order to flush away some of the *Legionella* and other biomass. This lowering of the cycles of concentration also lowers the pH and increases the effectiveness of oxidizing biocide treatment, particularly chlorine.

2. When the disinfection is ready to begin, shut off the tower bleed to avoid blowdown during disinfection, and shut off the fan. Make sure all areas of the system are open to the disinfection, and open any isolated loops.

3. For the disinfection, the following materials will be needed: a high range chlorine test kit, forms for recording the procedure, a defoamer and a biodispersant, as necessary, and an **oxidizing biocide**. Any oxidizing biocide may be used effectively, although sodium hypochlorite or calcium hypochlorite are recommended. Sodium dichloro-s-triazinetrione is very effective because it is a very concentrated source of hypochlorite ion, dissolves quickly and has alkalinity reducing properties.

4. Whichever biocide is used:

   A **concentration of <u>25ppm free available chlorine</u> must be achieved in the tower water and maintained for at least <u>2 hours</u>.**

   (see **ASHRAE Standard 188:2015** Table 8.2.9 for other chlorine ppm vs circulation time regimens).

5. After 15 minutes of disinfection, collect a sample of tower water and measure the chlorine concentration. If the concentration is not well above 25ppm, estimate the amount of additional oxidizing biocide needed and add it to the system. After one hour, measure again and add additional biocide if the concentration has fallen below 25ppm. After 2 hours, measure and record the final chlorine concentration.

6. At this time, return the system to normal operation (an increased makeup for a few hours is sometimes helpful for a rapid reduction in the residual chlorine). Remember to adjust the corrosion and scale inhibition program to off-set potential corrosion. Passivate the system with a phosphate-based chemical if appropriate.

7. Be sure to **collect a sample after the disinfection** to validate the success of the chlorine disinfection. It will be important to neutralize any residual free chlorine in the sample using a sodium thiosulfate tablet(s) before shipment of the sample to the laboratory.

8. Return the cooling tower to normal operations, adjusting the biocide treatment program as needed in order to control the *Legionella* in the future.