

## EFFECTIVE COOLING LAY-UP USING VpCI TECHNOLOGY

### Introduction

For those responsible for maintaining HVAC cooling systems in cold climate regions, the first hint of fall signifies that the time to lay-up their cooling systems is fast approaching.

In these cold weather regions cooling systems often are laid-up dry (fully drained) or partially drained. Towers are drained out to avoid water freezing in the system. Water treatment professionals can effectively treat these cooling water systems when operating throughout the year. However, when it comes to protecting an idle (non-operating) cooling system (i.e., seasonal lay-up) most conventional treatment methods fall short of delivering the best combination of performance, ease of use, and environmentally sound program.

### Preparation For Cooling System Lay-up

Achieving effective protection of the "entire" cooling system during lay-up requires more than proper application of VpCl's; it requires attention to detail of general lay-up protocol. Following are some fundamental practices that should be executed prior to and during system outage to ensure best results:

- 1) Reduce cycles (half the normal is suggested) seven to ten days prior to shutdown to reduce suspended and dissolved solids in the system.
- 2) Add the routine corrosion and scale inhibitors to maintain maximum concentration during this pre-shutdown period.
- 3) Add sufficient microbiocide to strip any existing biofouling and effectively sanitize the entire cooling loop just prior to shutdown.
- 4) Clean and flush the system of dirt and debris (especially the sump and low points in the system). Leave the sump drain open so that water will drain from the sump. Drain system as per routine.
- 5) Clear and flush all chemical feed lines and ensure all chemical tanks are winterized and closed to minimize exposure to air.
- 6) Remove and flush all probes/electrodes. Ideally, the by-pass rack will be left in the same condition as the system – consider installing corrosion coupons to monitor the system during the shutdown period.
- 7) Open and inspect all critical exchangers, clean as necessary and then close up as soon as possible.
- 8) If the system is stored wet, then routinely circulate the system water to prevent long periods of stagnation. This may require retrofit of plumbing to enable bypassing of the tower and condenser equipment.

### Application of VpCl Technology

#### *Cooling System – Drained Lay-up:*

This product is designed to distribute the VpCl inhibiting capability throughout the system by first dissolving in water and recirculating throughout the system. Place the water-soluble bag into the cooling water sump or shot pot feeder (if no sump or shot pot feeder exists, then predilute the COOLING LAY-UP 1980 to a 10% solution and pump into the system). Recirculate the treated water for 8 to 24 hours. Dose with four water-soluble bags per 1000 gallons of system volume. Target a minimum of 15 to 20 ppm molybdate as  $Mo^{+6}$  in the circulating water. Drain the treated water completely from the system and isolate the entire cooling system.

The system should remain drained and isolated so that the VpCl's are maintained within the system. An open system can reduce the period of protection significantly. If the system is already drained prior to application of the VpCl treatment, fill the system with fresh water, add the product as noted above, recirculate for 8 to 24 hours, and completely drain the water from the system. Under ideal conditions, protection can last as long as two years.

#### *Cooling System - Wet Lay-up:*

Same procedure and product as above except water is not drained at all or only partially drained. During the wet lay-up procedure, concerns for microbiological control and freeze protection may arise.

A non-oxidizing microbiocide should be added to the final lay-up solution. If an oxidizing biocide is used during disinfection, ensure the free halogen concentration is <2.0 ppm Free halogen, as  $Cl_2$  prior to addition of VpCl. Any system laid-up wet should be circulated and monitored periodically (minimum once per month). Monitoring should assess corrosion control (test for metal oxides and if available check corrosion coupons or probe) and microbiological control (test for general bacteria, SRBs and APBs).

In any of the lay-up procedures, the VpCl treatments are easily flushed from the system allowing the system to be prepared for return to service. The COOLING LAY-UP 1980 product provides multi-metal protection including ferrous, copper and galvanized steel surfaces.

### Summary

The COOLING LAY-UP 1980, if applied properly, can provide effective protection of an idle cooling system superior to conventional lay-up methods.

Protecting a cooling system properly during idle operation is one critical aspect of cooling system operation. It can improve efficiency, extend the life of the system and save the maintenance engineer a lot of time and money if done right■