



2013

Cooling Tower Water Management Plan

901 Fifth Avenue

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I. INTRODUCTION

This plan outlines the cooling tower chemical management plan for the building and meets the requirements of the LEED-EBOM 2009 rating system.

II. GOAL

The goal of this plan is to minimize the risk of the four main water related issues associated with cooling tower operation. These issues include the following:

- Scale Formation
- Corrosion
- Microbial Growth
- Fouling

This plan accomplishes this goal while also minimizing the costs and risks associated with the following areas:

- Water Usage
- Energy Usage
- Manpower
- Annual Maintenance Costs
- Equipment Lifetime Degradation
- Employee/Tenant Safety

III. SCOPE

The scope of this plan includes cooling tower chemical management activities. It includes, but is not limited to the responsibilities, performance metrics, time period, procedure and strategies, and record keeping documents involved in the cooling tower chemical management program. Service providers are responsible for carrying out their services in accordance with this plan without exception.

IV. RESPONSIBILITIES

The Chief Engineer and Property Manager will be responsible for informing all building personnel and tenants of this cooling tower management plan. The actual plan will be implemented by a combination of the building engineer and local third party chemical treatment account manager.

V. TIME PERIOD

This plan is effective immediately.

VI. PERFORMANCE METRIC

The metrics to ensure successful implementation of this plan include program goal and treatment level metrics. These measurements will be taken and calculated using both “Real-time” system measurement, and from periodic lab testing. Reporting of these levels will be done using a monthly Personal Service Report (PSR). These metrics include the following:

Program Goal

- Mild Steel Corrosion Rate (quarterly)
- Copper Corrosion Rate (quarterly)
- Water Usage
- Aerobic Microbial Level
- Anaerobic Microbial Level
- Legionella Level
- System Turbidity

Treatment Level

- Conductivity
- Mineral and Metal Concentration (Including Ca, Mg, Si, Cd, Fe, Cu)
- Alkalinity (Hydroxyl and Carbonate Based)
- Treatment Chemical Levels (Phosphonate, Nitrite, Ortho-Phosphate, Azole, Polymer)
- Halogen Residuals
- System Temperature

VII. PROCEDURES AND STRATEGIES

Chemical Treatment and Biological Control

The building should contract with a certified and reputable third party to provide water treatment services. The following products should be used when appropriate in the condenser, chill, and heating loops to prevent scaling, corrosion, and microbial growth:

- Scale and Corrosion Inhibitor – This product is used in the condenser loop to minimize corrosion and scale.
- Product in the condenser loop to reduce microbial growth.
- Closed Loop Corrosion and Scale Inhibitor – This product is added to all closed loops to minimize corrosion and scaling.

The measurement and feed of chemicals should be controlled with the conductivity controller. The calibration and operation of this system are checked semi-annually.

To aid in microbial control the cooling tower is cleaned and disinfected annually. The system should also utilize an online filter to reduce the contaminants that cause microbial growth.

Bleed-off, Make-up Water, and Target Concentration Ratios

To minimize the risk of scaling while also maximizing water usage efficiency the building employs the following protocol:

- Scales forming mineral concentration in the makeup and condenser water are tested seasonally. Based on these tests maximum concentration levels are established using French Creek analysis
- Based on these analyses a conductivity set point is established and maintained using the conductivity controller
- Conductivity data is logged weekly
- To ensure water usage efficiency water meter reading are checked monthly. Additional maintenance is also performed by Kennedy Wilson personnel on the tower drift eliminators.

Additional Cooling Tower Practices

The cooling tower only runs in an “As needed” basis in order to minimize the electrical, chemical, and water needs of the building HVAC systems.

Water meter readings are taken on a regular basis and conductivity is monitored continuously to ensure that there is no pipe leakage, or cooling tower overflow.

General Operational and Procedural Guidelines

The conductivity controller monitors conductivity and controls the blowdown solenoid and treatment pumps. The system is tested by the operators for the following levels weekly:

- Total Chlorine Levels
- Inhibitor levels
- System Conductivity to ensure proper calibration
- Water Meter Readings (monthly)
- Closed Loop Nitrite Readings (monthly)

Training

The Building operating engineers are trained on the following areas to maintain a safe work environment and an effective cooling tower chemical management program:

- Cooling Tower Basics – How a cooling tower operates and how water related issues are prevented
- Safety – How to handle and dispose of chemicals in a safe manner.
- Testing and Troubleshooting – The basic testing and adjustment that is necessary to maintain an efficient program
- The building holds contracts with third party cooling tower chemical treatment firms to provide chemicals and test and support the operating engineers in the proper operation of the cooling towers. During regular visits the operating engineers receive all necessary training to maintain the proper operation of the cooling towers.

Annually, training should occur to cover basic water chemistry fundamentals, the significance of maintaining a good water treatment program, examples of how systems can fail without a good program, impact on the environment with a good water treatment program and overall best safety practices.

VIII. RECORDKEEPING DOCUMENTS

All documentation, monthly reporting, annual reviews, service plan, and daily logs must be kept onsite. This documentation includes any documentation related to LEED-EB O&M certification.