



CASE STUDY

Restoring Cooling Tower Efficiency After Hard Water Contamination

INTRODUCTION

A major industrial facility experienced an unexpected power outage, forcing a temporary shutdown of its cooling tower system. Upon restarting operations, the facility switched to municipal city water to maintain production while assessing damage to the cooling tower components.

CHALLENGE

City water, while readily available, contains high levels of hardness minerals such as calcium and magnesium. These minerals are notorious for forming scale deposits, which can:

- Clog heat exchangers and processing equipment
- Reduce thermal efficiency
- Impair overall system performance

Within days of using city water, the facility observed a **25%+ drop in cooling capacity**, threatening production targets and operational reliability.

DIAGNOSIS

Hydrite deployed its proprietary diagnostic software to assess the system. The analysis revealed **significant fouling and scale accumulation** across critical heat transfer surfaces. Visual diagnostics (see images) confirmed the extent of the damage and pinpointed areas of concern.

One key finding was the performance of the heat exchanger. It was receiving cooling tower water with the control valve fully open at 100%, yet the system was unable to meet its temperature set point. The target temperature was 132°F, but the actual temperature reached 152°F—a full 20°F above set point, indicating severe inefficiency and restricted heat transfer.



SOLUTION

Hydrite implemented a two-phase remediation and prevention strategy:

1. System Cleaning (CIP):

- Performed a full Clean-In-Place (CIP) procedure using Hydrite's proprietary **Pureflux™**, a chemistry compatible with all system metallurgy which effectively removed scale and fouling without damaging sensitive components.

2. Proactive Water Treatment:

- Introduced **Hydricare™**, Hydrite's advanced treatment technology engineered for hard water environments which prevented further scale formation, restored full system capacity, and ensured optimal heat transfer efficiency.



RESULTS

- Restored 100% equipment utilization, the control valve setting dropped to just 39%, and the system successfully maintained the target temperature of 132°F.
- Eliminated scale-related performance losses which enabled 61% availability in valve capacity and a 20°F gain in cooling performance.

CONCLUSION

This case highlights the critical importance of water quality management in industrial cooling systems. With Hydrite's technical expertise, Pureflux™ cleaning chemistry, and Hydricare™ treatment technology, the customer not only recovered lost capacity but also safeguarded their system against future hard water challenges—supporting long-term reliability and efficiency.

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