INNOVAS TECHNOLOGIES™

Sacred Heart Medical Center

AN INNOVAS TECHNOLOGIES® CASE STUDY

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Manual cleaning has long been considered the “Best Practice” for keeping chillers running at the best possible level of efficiency, but new a new approach has changed the performance game.

ANNUAL SAVINGS

Electricity Cost Savings:	$62,000
Energy Conserved:	765,000 kW-hrs
GHG Emission Reduction:	582 tons
Equivalent Cars Removed:	103
Equivalent Trees Planted:	13,000

15-YEAR PROJECTED SAVINGS

Electricity Cost Savings:	$1,030,000
Energy Conserved:	11.5 Million kW-hrs
GHG Emission Reduction:	8,800 tons
Equivalent Cars Removed:	1,500
Equivalent Trees Planted:	195,000

Use Case & Background

Improving the efficiency & productivity of central cooling plants.

The PeaceHealth Sacred Heart Medical Center at RiverBend in Springfield Oregon is one of the largest hospital complexes in the State of Oregon.

Providing over 350 licensed beds, it admits over 23,000 patients yearly and its staff actively provide more than 15,000 inpatient and outpatient surgeries annually in most medical specialty areas.

Commissioned in 2008, PeaceHealth Sacred Heart Medical Center at RiverBend is built on 160 acres and is comprised more than 1.3 Million square feet.

The hospital includes 1,000,000 square foot acute care tower, 150,000 square foot Oregon Heart & Vascular Institute, 120,000 square foot medical office facility and a 30,000 square foot central plant facility.

Considered a wellness destination, Sacred Heart at RiverBend represents a state of the art approach to health care application and facility providing new levels of societal benefit to the surrounding Community.

Overview

Sustainability challenges required aggressive monitoring of chiller fouling.

The key in Sacred Heart's philosophy is to function with minimal adverse environment impact.

Built close to a cherished river system, Sacred Heart was challenged to operate using no chemical-based water treatment for its cooling water operations.

As a result, the facilities team employed non-chemical treatment systems and planned aggressive monitoring of chiller performance to ensure the chilled water plant operated reliably and efficiently under the no-chemical regimen.

Once commissioned, management soon discovered rapidly developing fouling in the condenser loops as a result of various forms of fouling.

The issue of degraded chiller performance due to fouling showed its itself most notably in rapidly rising chiller approach temperatures.

THE CHALLENGE

Specifically, the approach temperatures would climb in the PeaceHealth chillers within a few short weeks after manual cleaning and would rise as high as 17 degrees thus mandating another unscheduled manual cleaning event.

To make matters worse, the non-chemical treatment system seemed unable to stop the rapid growth of bacterial colony forming units that

showed up constantly in cooling tower water tests. This led to the frequent application of shock treatment to manage the persistent bio presence in the cooling water.

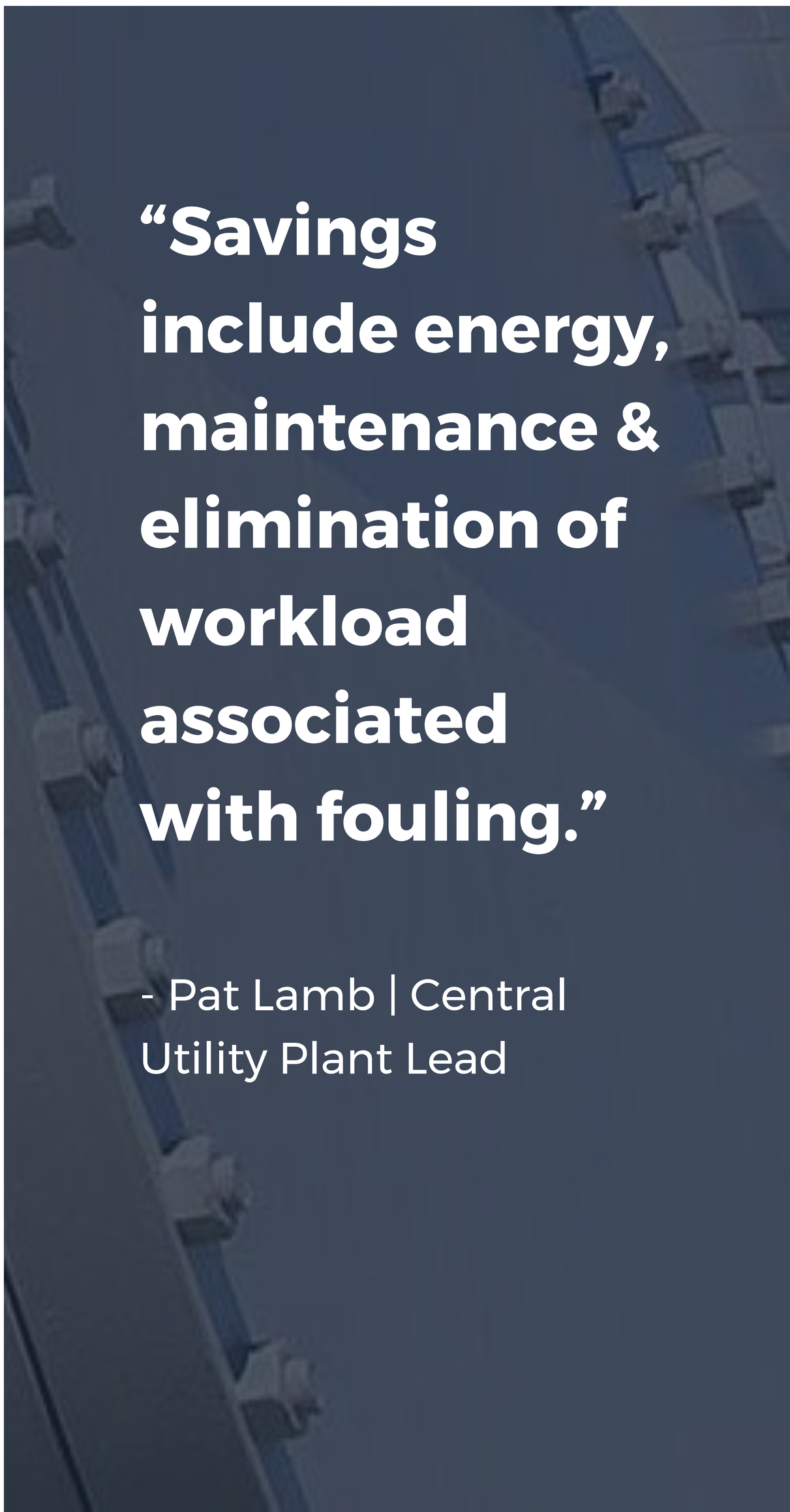
THE SOLUTION

Pat Lamb, the Central Utility Plant Lead, knew the chiller related fouling was a serious cost generating problem and that a solution had to be discovered. Pat researched alternative chemical applications, competing approaches to non-chemical treatment and Automated Tube Cleaning Systems (ATCS) from brushes to ball cleaning systems.

After thorough study, Pat chose the sponge ball ATCS as the best solution to provide control of the significant fouling problems in his chilled water system.

Through collaborative meetings, Innovas and UW - Madison created a plan to install a Helios TCS for a cooling season, and measure and validate results compared to an identical chiller operating under the same conditions but without a Helios TCS.

Key to the plan was that Innovas would guarantee the risk, if the Helios TCS results weren't as expected, Innovas would take it back.



Results

The ATCS systems provided exceptional fouling prevention and cleaning.

After initial installation in 2013, the ATCS systems have provided exceptional fouling prevention and cleaning at PeaceHealth at RiverBend.

In fact, the facilities team has not had to clean the condensers since the day the ATCS's were activated, now going on four years.

Hospital leadership responded to Pat's approach using data and the true cost attributed to condenser fouling.

Approach temperatures? Well Pat Lamb states that they don't vary from .5 to 2 degrees at any time during the operating year and have remained "flat line" consistent with little or no variability since the installation of the ATCS system.

Additionally, PeaceHealth employees a staged chiller model of operation.

Since the introduction of the ATCS, the reserve chiller runs much less frequently due to increased capacity of the operating chillers.

This is a very significant savings attribute we don't even include in the base savings report below.

Interestingly, the colony forming units of bacteria have been virtually eliminated as a result of the removal of the incubation location inside the hot and previously fouled condenser tube bundles.

Lastly, PeaceHealth's chillers were opened January 2017 for scheduled eddy current testing. "All chillers were perfectly clean!" stated Pat Lamb. Quite a testimonial to the ATCS.

The Lesson

“We couldn’t be happier with our ATCS system and its proven results.” –

- Pat Lamb | Central Utility Plant Lead

performance. In a sense, this is an example where established operational habit, hides a very costly, and churn generating inefficiency or flawed process (periodic manual cleaning).

It is often difficult for process and systems managers to look to new approaches to solve long established problems that are managed through the status quo even though large savings are possible through changing the conventional procedures.

The reasons include capital restrictions or inflexibility found in many organization cultures.

Regarding chiller performance, manual cleaning has long been considered the “Best Practice” for keeping chillers running at the best possible level of efficiency, but new approaches enable a significantly better chiller

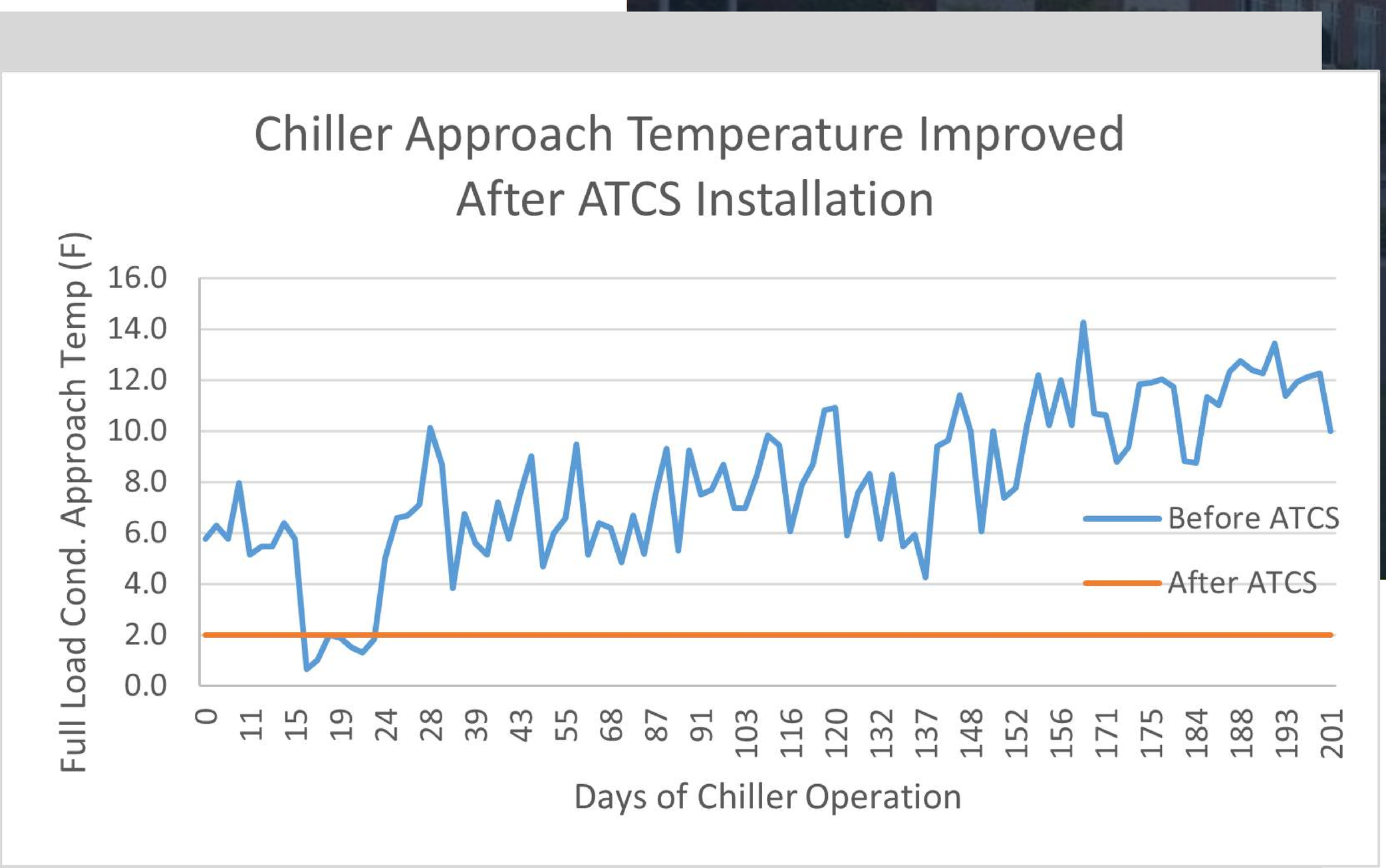
In a sense, manual chiller cleaning is an example where established operational habit hides a very costly inefficiency or flawed process.

Pat Lamb recognized this issue and actively sought to find a better way to solve the problems his team faced related to condenser fouling which led him to the sponge ball ATCS and his follow-on work with Innovas Technologies.

Pat studied technical alternatives, selected the right solution and then actively “sold” the solution to hospital leadership using data and the true cost attributed to condenser fouling.

The result is an industry leading new benchmark in chiller cleaning and expecting cooling efficiency at PeaceHealth.

Pat Lamb agrees and states, “We couldn’t be happier with our ATCS system and its proven results.”



Savings in detail.

In the end, Pat was successful in solving the problem.

The results over the long term are millions in savings enjoyed by PeaceHealth Sacred Heart Medical Center at RiverBend.

Savings include, energy, maintenance and elimination of workload associated with fouling related issues in the hospital's chillers.

In the context of climbing healthcare costs, this is a bright example where a progressive facility seeks and finds efficiency within and saves its constituents real money.

Annual Savings

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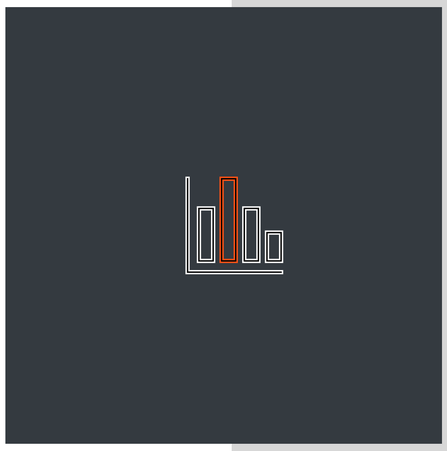

15 Year Projected Savings

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The Helios® Cleaning Cycle

The Helios cycle is fully automatic and controlled by a programmable controller.

1. Between cycles, the sponge balls are stored in the Collector and all valves are closed.
2. At programmed intervals, the Controller commands the injection valves to open and pump to start, and the balls are injected into the heat exchanger inlet line.
3. Normal cooling water flow transports the balls through the heat exchanger tubes and into the Ball Trap.
4. The Controller then prompts the collection valves to open and pump to start, and the balls are returned to the Collector, where they are held until the next injection/collection cycle starts.

View the Helios TCS Operation in action at innovastechnologies.com

Prevents scale.

Prevents scale, fouling, biological life and corrosion in heat exchanger tubes.

Reduces maintenance costs.

Reduces maintenance and downtime costs by eliminating manual or chemical tube cleaning.

Extends service life.

Extends the service life of heat transfer equipment.

The Helios Tube Cleaning System®

The Helios Tube Cleaning System® from Innovas improves the energy efficiency of cooling systems.

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See Helios in Action.