Improving Operational Performance with OSIsoft and the PI System

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WASTE MANAGEMENT

Think Green.

Wheelabrator Technologies Inc.

A Waste Management Company

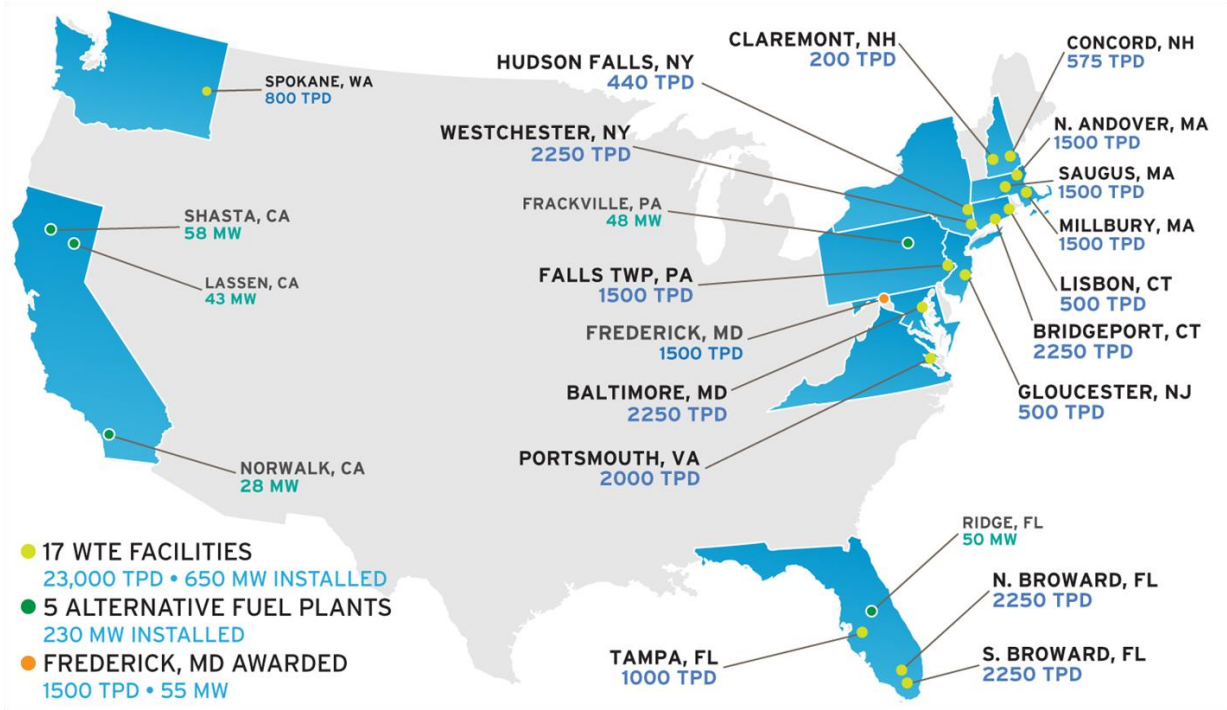
About Wheelabrator Technologies Inc.

- Wheelabrator pioneered the waste-to-energy industry in the U.S. when it designed, built and operated the first commercially successful facility in Saugus, Massachusetts, in 1975. Three decades later, Wheelabrator is still operating its 1500-ton-per-day Saugus waste-to-energy facility.

- Wheelabrator's U.S. waste-to-energy operations currently total 16 facilities with a combined processing capacity of more than 23,000 tons per day of municipal solid waste and an electric generating capacity of 664 megawatts (MW).

- Wheelabrator's four alternative fuel power plants have the generating capacity to produce an additional 184 MW of clean electricity. Combined, Wheelabrator's facilities provide enough clean electricity to power more than 900,000 homes

Wheelabrator Technologies Inc. North America



Efficiency has not always been a top priority, in fact, increased fuel throughput resulted in increased revenue

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- Today, the focus has definitely changed. Energy prices have fallen, recycling rates have improved, and waste volumes have decreased

- Finding ways to increase efficiency is now a bigger priority than ever...

We chose the PI System to analyze data from the DCS and from operator rounds

PI System Pilot – Saved $150K Demand Charge

- To validate the concept and potential return on investment of installing the PI System company-wide, Wheelabrator chose to pilot a 2250 TPD facility.
- One event justified the investment when gland sealing steam control issues were effecting bearing vibration.
- The PI System provided the resources to identify and avoid a costly turbine trip worth ~$150k in demand charges, roughly a one year payback

Wheelabrator Technologies Inc. Performance Monitoring Center Hampton NH

- The Performance Monitoring Center is staffed with three engineers with power plant operations backgrounds and a fourth engineer working outside of the center, focusing on specific process improvement projects using the PI System

- IT support for the PI System for all 19 facilities is maintained by Wheelabrator internal IT department

OSIsoft Products Utilized

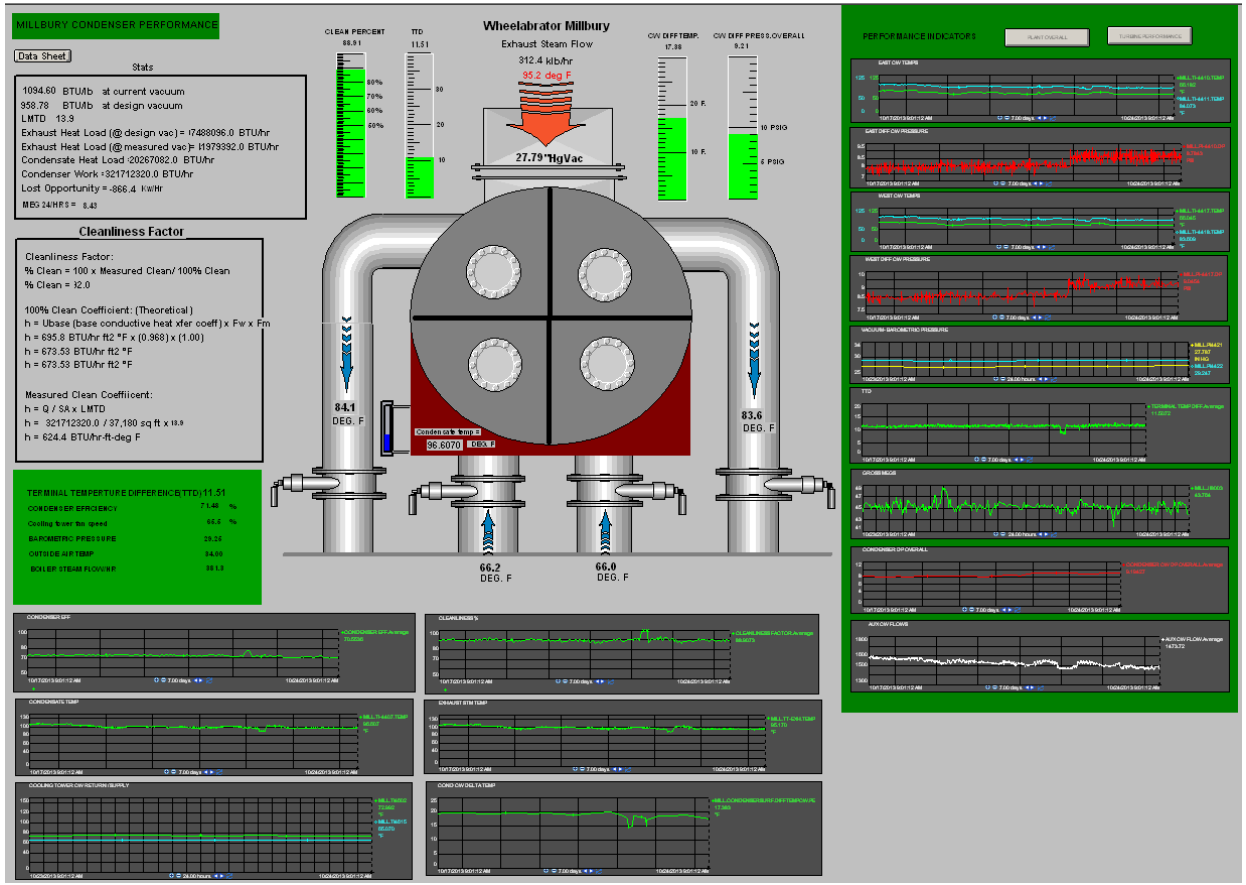
- PI ProcessBook is used extensively to create trends and displays that can be formatted to grab an operators attention at tighter set deviations from set point, allowing the operator to distinguish proper operation versus mis-operation at a glance
- PI DataLink provides the ability to view historical data reports as well as “up-to-the-minute” reporting by enabling the “update” function, and also provides the platform to view the operators’ handheld rounds data
- PI Manual Logger has changed the way our operators perform rounds as well as safety equipment inspections
- PI SMT allows “super users” the ability to create tags and Performance Equations

Where we have seen Payback...

Cooling Tower Performance - $450K/Year

- A facility experiencing a decrease in megawatt production
- The cooling tower fill was near end of life and was assumed to be the culprit
- The PI System proved that assumption wrong
- Focus shifted to the drift eliminators and it was determined that they created considerable air flow restriction. Half were removed.

Condenser Performance Display

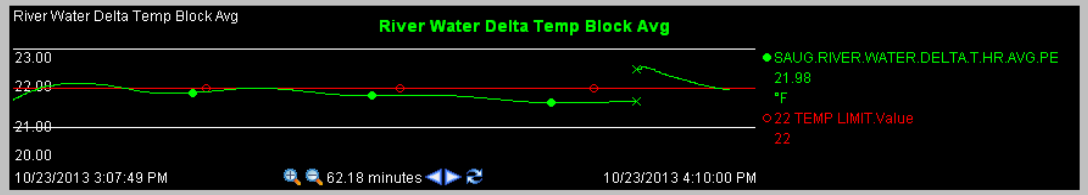


River Water Temperature Permit Compliance - $300K/Summer

- A facility using river water for main cooling water was effecting changes in the boiler loads in order to maintain compliance with their river water temperature permit, and was losing money simply by overcompensating

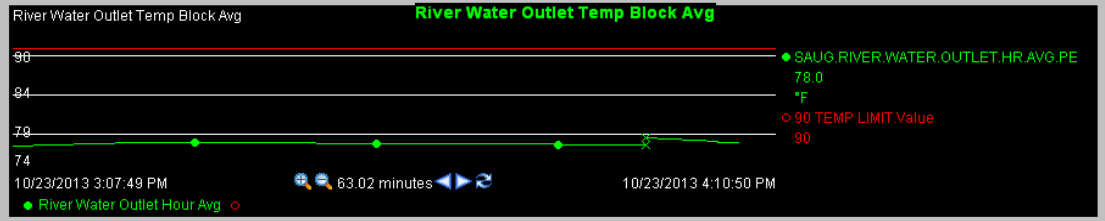
The PI System gives the operators a tool with which to make those adjustments with accuracy.

River Water

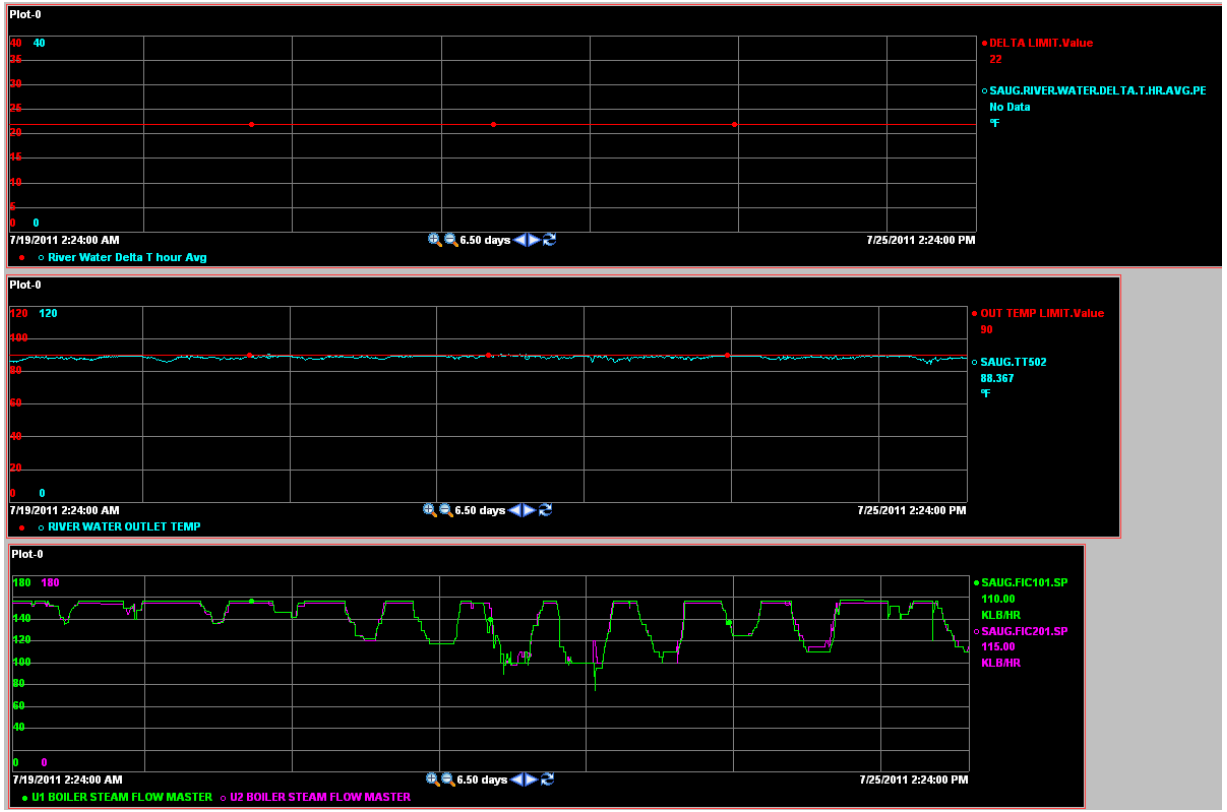


Instantaneous River Water Delta T	21.86 °F
River Water Delta T Hour Block Avg	21.98 °F
River Water Delta T LIMIT	22.00 °F

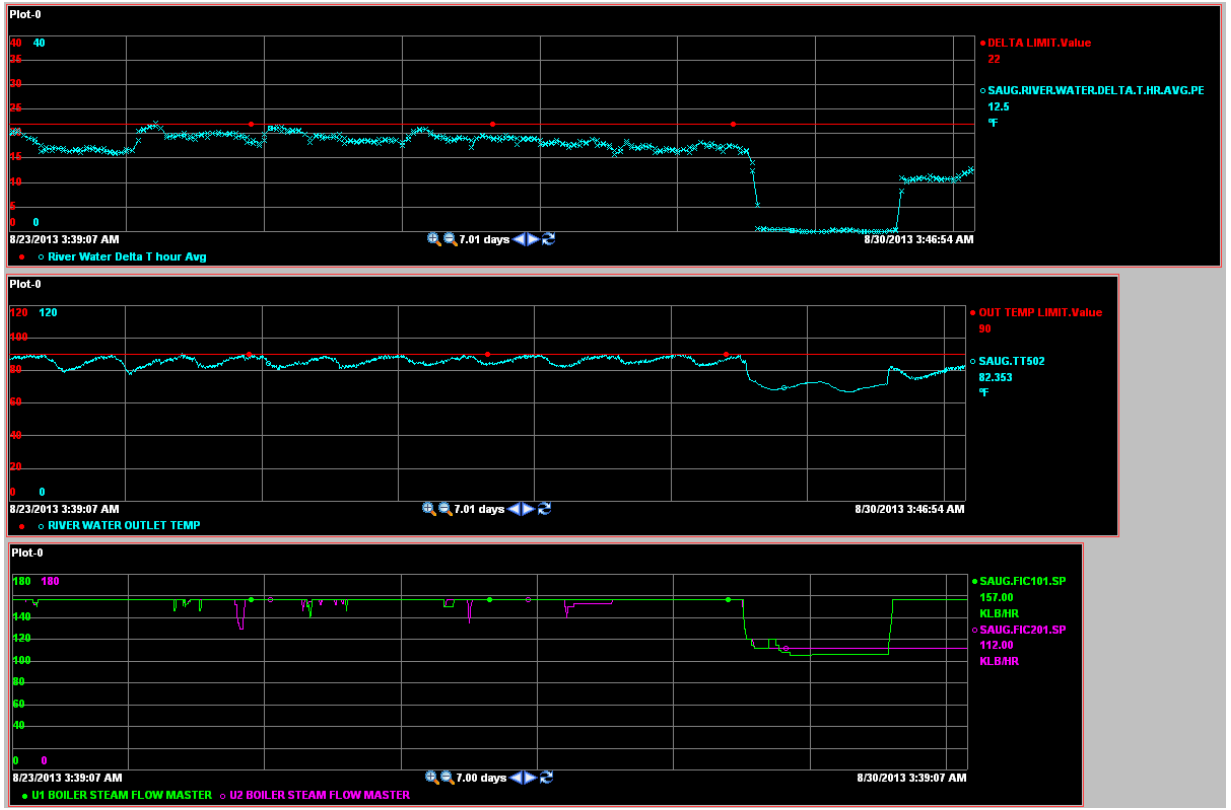
Instantaneous River Water Outlet	77.66 °F
River Water Outlet Hour Block Avg	77.96 °F
River Water Outlet LIMIT	91.63 °F



River water temperature and boiler control pre-PI System



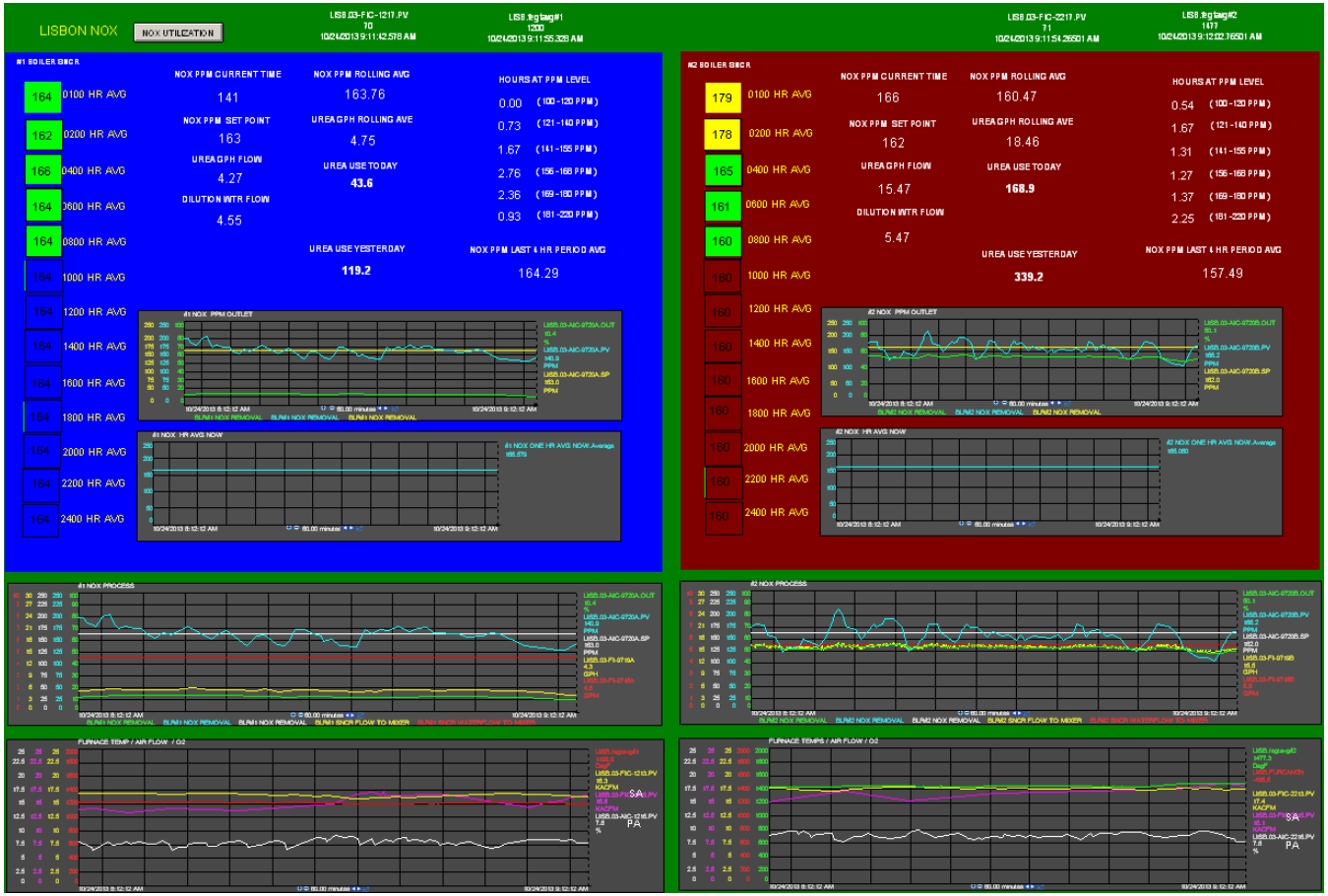
River water temperature and boiler control post-PI System



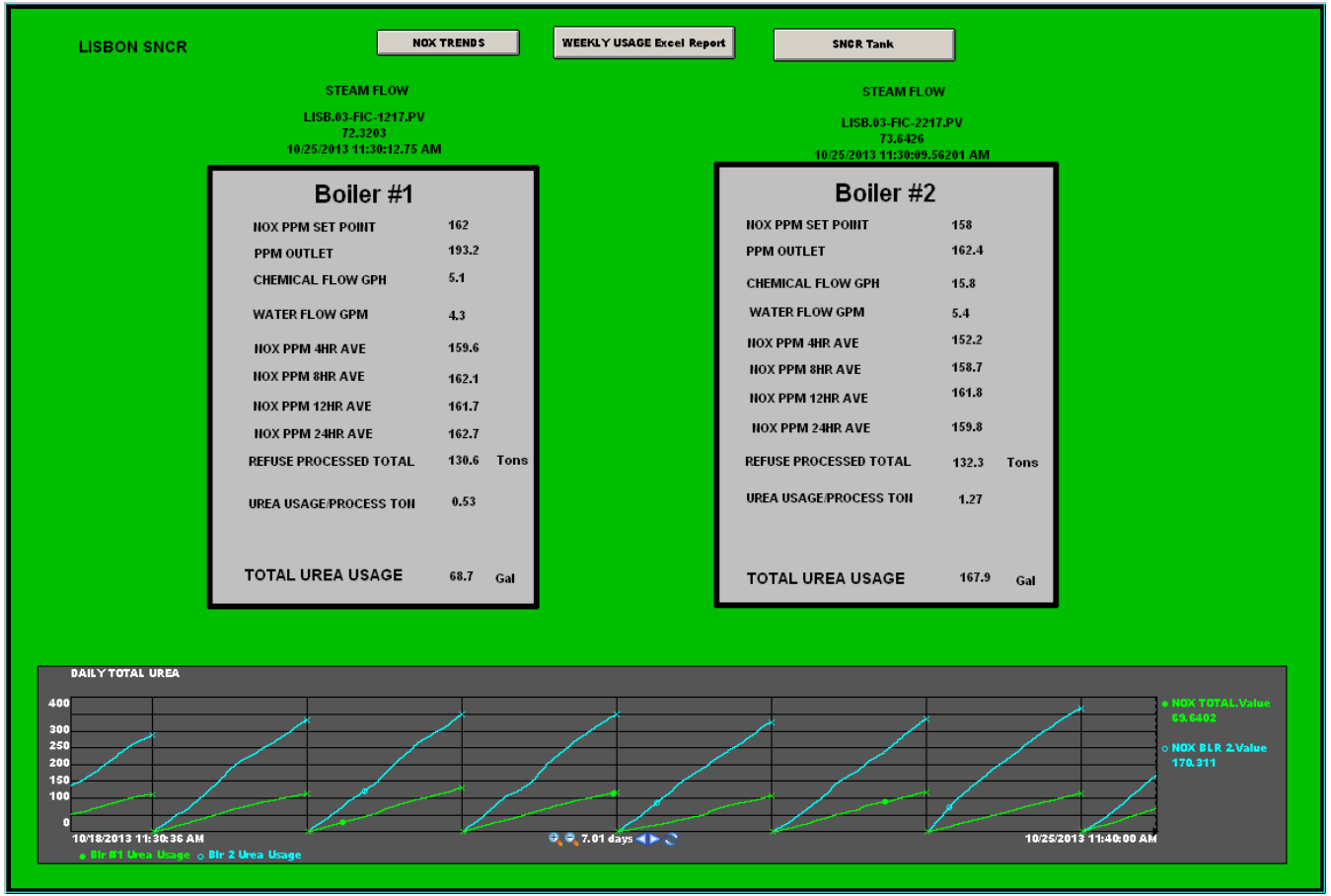
Chemical consumption

- Injecting excessive urea, the chemical used in our DeNOx systems, not only costs money but also can damage boiler components.
- We have been able to target hi-use facilities and produce displays that allow plant operations and management to stay on top of their usage
- Assuming urea costs $1.60/gallon, if a plant using 600 gallons of urea per day reduces consumption by 20%,
- That would mean $70K per year... Times 10 plants?

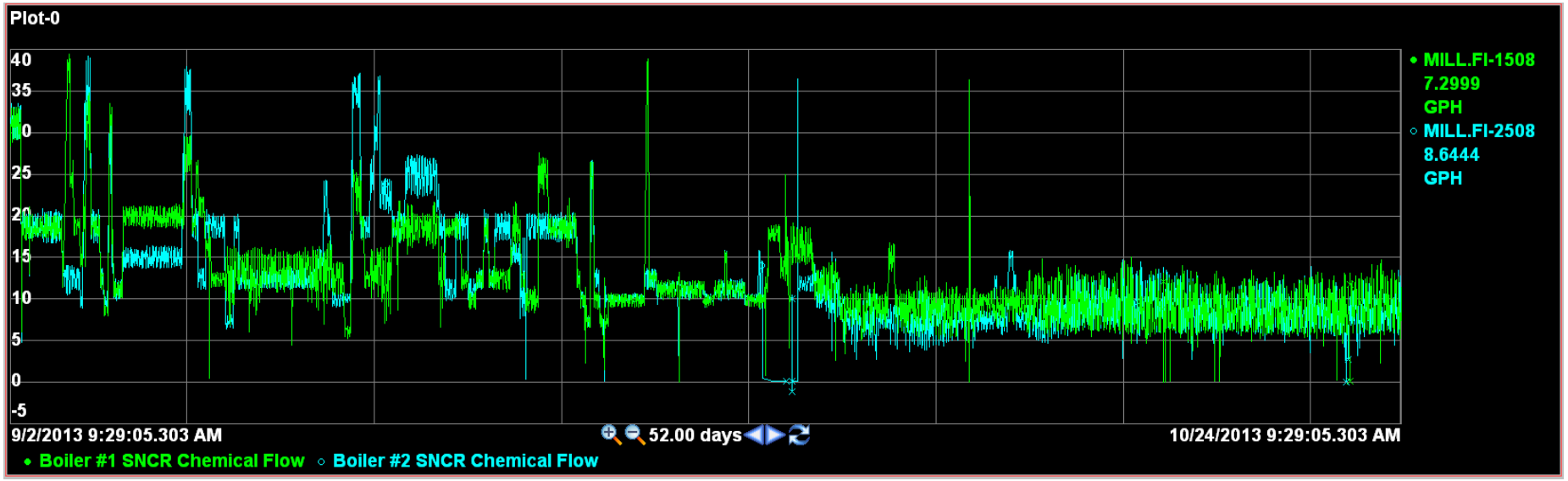
DeNOx monitoring



DeNOx monitoring



Obvious improvement...



The Psion Workabout Pro 3 is our handheld device of choice. The Windows Mobile OS is a familiar platform and the case is very durable, as long as you don't use it as a wheel chock, or a door stop, or a hammer...

Handheld Computers

- Allow us to USE the data that operators gather every day
- Data is now archived, easily find-able and trend-able

...not lost in a box at Iron Mountain

Instrumentation Opportunities

- Using the PI System has also afforded us the ability to scrutinize the accuracy of our data and the reliability of our instruments as well as the importance of “complete” data

- Our facilities were not originally fitted with all of the instrumentation that we now realize is crucial for proper analysis of system efficiency.

The scale is shifting from “construction mode” to “analysis mode” and we expect to see initiate many more wins for the bottom line.

Next Steps…

- Using power pricing data scraped from the internet into the PI System to help us to understand when it would make financial sense to run the boilers hard, at reduced load, or to possibly remove them from service.

- Investigate the PI AF application for use in monitoring performance across facilities with slightly to modestly different designs and technologies.

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