



City of Atlanta

Designed for Success

Results

- Dramatic improvement in emissions control
- Reduced labor costs
- Fast implementation, startup and commissioning
- Easy integration
- Automatic data collection and reporting

"With the integrated GE Fanuc components and technical support, projects that would normally take many months to complete took only weeks. This greatly reduced our startup time and helped enable us to meet our tight implementation deadline."

Hank Adams

Plantwide Integration & Control

Full Steam Ahead!

Cost-Effective, Fast-Track WRC Furnace Upgrade Yields Dramatic Emission Control Improvements

Tourists and residents alike rightfully have a peach tree pretty picture of Atlanta, Georgia. This beautiful area boasts scenic views, well-planned parks and tree-lined streets. But, like all heavily populated areas, the city also has heavy wastewater treatment needs. At the R.M. Clayton Water Reclamation Center (WRC), two outdated multiple hearth furnaces (MHFs) had been causing a visible plume that was a source of public discussion on the northwestern outskirts of the City of Trees. Used for 30 years to thermally dispose of biosolids, the MHFs also would not meet EPA's new Part 503 THC emission standards and were unable to provide sufficient backup disposal capabilities while newer technologies and other removal options were explored. Fortunately, the City of Atlanta was able to improve the view – and environmental friendliness – with a recent upgrade of the furnaces, which has completely eliminated the plume and dramatically improved emissions control.

A Burning Need to Upgrade

The R.M. Clayton WRC produces about 50 dry tons per day of anaerobically digested biosolids, typically 20-21% solids and 55% volatiles. Burning biosolids, rather than transferring wet sludge to a landfill, is, in and of itself, a more environmentally friendly method of disposal. Not only are sludge accumulations and the risks of a biohazardous spill en route to a landfill alleviated by burning, burnt sludge is recyclable, its ashes used in brick construction. However, the



imagination at work

outdated scrubbing equipment, lack of afterburning provisions, and inefficient, high-maintenance pneumatic controls on Clayton's outdated furnaces meant these blasts from the past needed a serious overhaul to accommodate future environmental regulations and increased usage.

An upgrade design for the Clayton MHFs had been completed in the mid-90s; however, the plans were suspended due to limited time, insufficient funding, and public concern about propagating an outdated – and aesthetically displeasing – method of biosolids processing. Later, the City of Atlanta reviewed its future biosolids disposal options. Since the deadline for meeting EPA's Part 503 emission requirements loomed less than a year away and since the city needed to have sufficient backup disposal capabilities while other disposal options were explored and commissioned, the review recommended proceeding with the previously planned upgrade of one of the MHFs at the Clayton WRC.

In light of the challenges facing the upgrade, the project's success depended on several key elements:

- A "fast tracked" design-build construction contract to meet the deadline and save costs,
- A design upgrade value engineering review, and
- Inclusion of the latest and most cost-effective emission control technologies to accomplish the upgrade within a limited budget and to alleviate public concerns.

Working with JJ&G Consulting (Atlanta, Georgia) and Industrial Furnace Company (Rochester, New York), the City of Atlanta's Construction Management Group embarked on a project to improve the system, having less than nine months to engineer and commission the project before the EPA's deadline for Part 503 compliancy. Reviewing recent upgrade experiences at other WRC facilities enabled the team to confirm and incorporate specific emission and operational control improvements that were best suited for the Clayton MHFs. The resulting new biosolids thermal processor is monitored and controlled by a GE Fanuc automation system, which was designed and integrated by Plantwide Integration & Control, LLC, part of Industrial Furnace Company.

Firing up a New Automation System

The new "smart" burner controls, including GE Fanuc's QuickPanel Mini and other equipment panels, are running on GE Fanuc's CIMPLICITY®* HMI Plant Edition software platform. This easy-to-use, web-based monitoring and control software consolidates the collection of data from devices throughout the burning process, then transforms that real-time data into dynamic text, alarm and graphic displays. Information is presented on users' PC screens and on a 42-inch plasma digital monitoring and display screen located in the central control area for a quick, easy-to-view snapshot of the system.

"With its graphical capabilities, the new automation system is easy to use and very convenient," said Plant Operator David Pirkle. "The



large monitoring screen with its Windows-like appearance is also a welcome improvement. We're able to get better performance since the upgrade while avoiding a more significant investment."

The system also features a GE Fanuc Series 90™-30 PLC as the main processor for all control and communications. A VersaMax™ PLC with SE accessory enables connection of more than 400 I/O points throughout the biosolids thermal processor to an Ethernet network via the serial port on the PLC. Because all control and communications are done via Ethernet and fiber optics, the furnace control system is connected directly to the WRC's existing desktop PC Ethernet network, making the control system directly and remotely available to plant maintenance and management personnel from either their office PCs or off-site locations. This remote access feature is an invaluable time and money saver, allowing immediate identification and troubleshooting of problems regardless of where personnel are physically located.

The new system also enables automated reporting of emissions. The CIMPLICITY software is integrated with a continuous emission monitoring system that generates and e-mails reports directly to the appropriate people, greatly reducing labor costs and decreasing reporting errors.

Additionally, GE Fanuc's QuickPanel Mini operator interfaces are located throughout the multi-level facility. These easy-to-use, cost-effective graphical interfaces support commonly used panel operations like push-buttons (including illuminated ones), pilot lights, bitmaps, numeric entry, numeric display, static text, legend plate, selector switches, and local message displays. Operators use these 6-inch monochrome LCDs displays to start and stop fans and drives, and to control temperature, flue gas recirculation, and various other processes within the biosolids thermal processor.

* Part of Proficy Intelligent Production Solutions from GE Fanuc.

A Blazing Success

The upgraded furnace was officially performance tested on time – a remarkable achievement given the 8-month time frame from ordering equipment to testing performance, and one that saved the City of Atlanta a substantial amount of money. Had the planned upgrade not been completed in time, the second furnace would have been shut down for EPA non-compliance, and the City would have been forced to truck all the biosolids to a landfill, an expensive undertaking. According to Plantwide Integration & Control's Hank Adams, the ease with which the control system was implemented played a large role in the successful, on-time commissioning of the new furnace.



"Actual site construction did not start until the last week of May, leaving less than three months to remove the old equipment, install the new upgraded equipment, and still allow time for start-up and performance testing," Adams said. "With the integrated GE Fanuc components and technical support, projects that would normally take many months to complete took only weeks. This greatly reduced our startup time and helped enable us to meet our tight implementation deadline."

Now burning the same amount of biosolids previously handled by two furnaces, the newly-revamped MHF's performance improvements are as dramatic as the altered appearance of the skyline above it. Particulate emission rates are now 88% below EPA standards. Overall 503 target metal removal efficiencies are 99.99%. THC concentration is 88% below EPA standards. Target organic compounds have been effectively reduced to miniscule levels by afterburning in the 1200-1250 °F range.

"Nearby residents actually called us to find out what we were doing with the sludge and thought that we had turned off the furnaces," said Marcia Hurd-Wade, Program Manager for the City of Atlanta's Construction Management Group. "They were amazed to find out that the furnace was still running."

The human aspect was, as always, an important ingredient in the project's success. "Bringing together such a talented and dedicated group of people who could get the job done quickly and effectively made all the difference," said Hurd-Wade.

Adams added, "Our goal was to achieve the greenest possible method of biosolids waste disposal. With the new furnace configuration and automation, we feel that we have accomplished our goal."

Anyone who has seen the northwestern skyline of Atlanta before and after the upgrade would undoubtedly concur.

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Additional Resources

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