Fuel Reduction Pilot Program

CONDUCTED AT

INC. VILLAGE OF FREEPORT ELECTRIC GENERATING PLANT

LOCATED IN

Freeport, New York

TEST RESULTS
FOR
STEAM HEATING BOILER

A Confidential Report
Prepared by
Intellidyne LLC

SEPTEMBER 2004

FREEPORT ELCTRIC PILOT
REPORT SUMMARY

The attached technical report summarizes the Energy Saving Performance of the *IntelliCon*®
"CHS-HP"" energy saving control which was installed on a High Pressure (45 PSI), dual fuel
fired, steam boiler manufactured by Orr and Sembower with 2.892 mbh input. The
IntelliCon® unit was installed at the Freeport Electric generation plant on Sunrise Highway
in Freeport, New York and the validation data was collected from July 31, 2004 to August
29th, 2004. The test data was collected using "alternating day" methodology which is further
describe later in this report.

The boiler operates "24x7" 12 months per year and provides heat to preheat the "jackets" of
the electric generators at the power plant. The test data in this report reflects a reduction in
run time and a significant reduction in cycling on the system. With the *IntelliCon*® control
installed, the boiler achieved a reduction in total **run time of 15.29%** and a significant
reduction in the on/off cycling of 18.1%%.

The individual report contain the comparative "run time" hours that supports the summary
results and further details the specific length of the test and the number of burner on/off
cycles..

This "pilot study" clearly shows the *IntelliCon*® control delivers above the minimum
guaranteed savings of 10% and, by significantly reducing "cycling", should provide the
additional benefit of extending the operational life of the boiler and reducing the amount of
fuel pollutants that are vented into the atmosphere.

Additionally during the test there were no occurrences of "lower pressure" alarms and the
low pressure alarm setting was adjusted to 12 PSI. This revised alarm setting will insure that
the IntelliCon control can maximize energy savings and still insure adequate heating for the
generator jackets.

INTELLIDYNE
"Smart ways to save energy"

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Glen Cove, NY 11542
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Test Report

Report No. 12135

Date: 09/01/04

Customer:

Incorporated Village of Freeport
220 Sunrise Highway
Freeport, NY 11520

Contact: Les Endo Jr.

Test Site Location:

Freeport Electric Plant
220 Sunrise Highway, Freeport, NY 11520

Contact: Les Endo Jr.

Test Type: ☑ HEATING ☐ AIR CONDITIONING ☐ REFRIGERATION ☐ OTHER: _____

Product Tested: ☐ HW ☐ LCH ☐ LCS ☐ CHW ☑ CHS ☐ AC ☐ CAC ☐ RU ☑ OTHER: High Pressure

Type of Equipment:

High Pressure Steam Boiler
Manufacturer: Orr and Sembower (O&S)
Model #: PF-1H
2,891,700 BTU/hr input, #2 Fuel Oil / Natural Gas
Application: Warming of Generator Water Jackets & Area Heating

Test Start Date:	07/31/04
Test End Date:	08/29/04
	========
No. of Days in Test:	30

BURNER RUN-TIME:

☑ in HRS. ☐ in MIN.

IntelliCon ON-DAYS: 204:57:48

IntelliCon OFF-DAYS: 241:57:38   RUN-TIME was reduced by: **15.29%**

BURNER USAGE FACTOR:

IntelliCon On-Days: **57%**

IntelliCon Off-Days: **67%**

BURNER CYCLING REDUCTION:

IntelliCon ON-DAYS: 876

IntelliCon OFF-DAYS: 1070   Cycling was reduced by: **18.1%**

Savings = 15.29%

COMMENTS:

EQUIPMENT USED FOR TESTING PURPOSES

Specific timing and data logging devices are used to gather detailed information about the unit(s) being evaluated. Each device has been carefully selected for its reliability, capability and function. The individual devices INTELLIDYNE uses are explained below.

1. TIME CLOCK:

Manufacturer: Tork   Model: 8007V-0

Is used to switch the IntelliCon® product in and out of the circuit. This is done on a 24 hour basis. The result is that the IntelliCon® product is in control ("in" the circuit) one day and not in control ("out" of circuit) the next day. A 14 day time clock was selected so that a complete alternation of days that IntelliCon® is in control would result.

2. CURRENT SWITCH:

Manufacturer: Veris Industries   Model: Hawkeye 608/908

The current switch is used to monitor when current is being drawn by the cooling/refrigeration compressor or heating burner. When current is sensed it is "On" when no-current is sensed it is off "OFF". The current switch is used in conjunction with the "Change-of-State" data logger.

3. "CHANGE–OF–STATE" DATA LOGGER:

Manufacturer: Onset Computer Corp.   Model: H06-001-02

This device monitors and logs the "change-of-states" (the on / off status) of the unit being tested. It is used in conjunction with the CURRENT SWITCH, above, and time and date-stamps (logs) each change of status. By processing the logged data, the durations for each cycle can be determined.

4. "LIGHT INTENSITY" DATA LOGGER

Manufacturer: Onset Computer Corp.   Model: HLI

This data logger is used to monitor and log Light Intensity and is used to determine the solar-load influence on the facility.

5. "T/Rh " DATA LOGGER

Manufacturer: Onset Computer Corp.   Model: H08-004-02

This data logger is used to monitor and log the temperature and relative humidity in the conditioned space.

6. "TEMPERATURE" DATA LOGGER

Manufacturer: Onset Computer Corp.   Model: H08-001-02

This data logger is used to monitor and log the outdoor air temperature, and is used to determine the degree-day influence on the facility

WHAT DATA IS COLLECTED

Linking all of the above together with the IntelliCon® product being "in" and "out" of the circuit, on alternating days, yields the following data:

? How many on/off cycles per day (if applicable).
? Total "on time" per cycle, per day.
? Total "off time" per cycle, per day.
? What the solar load of the facility was during the test period (if applicable).
? What the relative humidity in the conditioned space was during the test period (if applicable).
? What the temperature of the conditioned space was during the test period (if applicable).
? What the outdoor air temperature was during the test period (if applicable).

How The Data Is Analyzed

Upon completion of the test, all the data is evaluated to calculate the reduction of consumption (savings).

Short-term testing analysis can only be performed properly by the elimination and reduction of as many variables as possible and through the analysis of the data on a statistical basis. The alternating "in" circuit / "out" of circuit testing has the advantage of minimizing the variations due to time-sensitivity, day-of-week sensitivity, degree-day effects, etc.

In order to properly evaluate the data, the following must be determined:

1. A baseline must be established. Baseline consumption data is the "use" or consumption information that is unaffected by the IntelliCon economizer ("out" of circuit). This may be derived during the test (which is what is done here) or from historical records. The advantage of deriving the base-line during the test is that site specific degree-day and solar data may be determined as opposed to weather-service data that may or may not be indicative of the test site.

2. It is necessary to determine what effects or influences are caused by solar- load and degree-day variations. This is done by performing a statistical analysis on the solar and degree-day data collected during the base-line phase.

3. In order to properly compare the two consumption cases (IntelliCon "in" and "out" of circuit), and determine the savings, it is necessary to adjust (or "normalize") the data collected during the "in-circuit" phase. The consumption data collected when the IntelliCon economizer was "in-circuit", is "normalized" by compensating for the effects of the solar and degree-day influences that occurred during the same phase of the test. This is accomplished by applying the statistical analysis results of the solar and degree-day influences (collected during the base-line phase) as a means to compensate for the solar and degree-day variations that occurred during the "in" circuit phase of the test.

4. The normalized consumption data acquired during the "in" circuit phase is compared to the base-line data and the savings determined.