

Reasons why FALCONEER™ IV provides value to incinerator operation

The operators have 4 tasks to do to operate the furnace properly, whether in APC or Manual mode, while achieving energy savings and preventing equipment problems or failures:

- 1) Maintain proper furnace temperatures
- 2) Burn all the sludge completely
- 3) Meet emissions requirements
- 4) Minimize Fuel Usage (natural gas)

The FALCONEER™ IV Virtual Workforce Solution is set up to assist the operator in performing his/her job with task #1, #2 and #4, and partially with #3.

1. FALCONEER summarizes all the alarms in a single dashboard versus operators need to look one by one on the SCADA screen. Green is good operation that no alarms will appear on the tree and yellow is caution or warning before it is out of control range and red is out of control range. (See Figure 1). Use of this dashboard will prevent damaging temperatures in excess of 1650 deg F and identify the onset of dropping temperatures.
2. FALCONEER provides simple intelligent statistical process control chart. The chart with limits that operators need to keep in the green zone for good operation, yellow zone is the caution before it is out of control range, and red zone is out of control range. (See Figure 1). Use of these charts help maintain normal, energy-saving, non-damaging operating conditions and will alert the operators to make proper adjustments to the correct parameters sooner (before any Hi or Lo control system alarms provide indication).
3. FALCONEER provides real time key performance indicator (KPI) calculations. Any type of engineering calculation or rule of thumb that engineers or operators use for proper operation or identifying problems and which are important for them to track in real-time can be done with FALCONEER the same way it is done with actual field sensors.
 - An example that is already built is the fuel usage KPI. FALCONEER built the predicted fuel feed calculation base on the cake % solid provided by the design chart. This calculation can help operators watch how much fuel they need to use in real-time to operate the incinerators. At the same time, FALCONEER also provides second calculation comparing this predicted fuel feed with actual fuel feed. If the difference between these two values is big enough (more than 5 therms/hr or about \$5/hr cost savings), an intelligent statistical process control alarm will flag to notify operators to cut back fuel to maintain or achieve fuel savings (See Figure 2)

4. FALCONEER also has attached the standard operation procedures in an electronic form for operators where they access it in FALCONEER at any time.
5. Beside all benefits above, FALCONEER also provides two daily reports that can be emailed for supervisors and engineers. The alarm summary report records all the alarms that happen in the past 24 for those who can use this information.. The executive summary reports record the key performance indicators like fuel savings calculation or critical temperature or emissions conditions to provide a quick snapshot of what is happening. All these reports are saved. You can open the reports anytime you want in FALCONEER. (See Figure 3 and 4)
6. FALCONEER is easy to use software. No programming is necessary. Potential of FALCONEER for WSSC is also helping to pull all data from any sites of plant like liquid site into FALCONEER single dashboard, set the intelligent process control limits, and do any type of calculations.
7. Also, FALCONEER can help to build an operation shift performance report. (See Figure 5)
8. No significant effort or time is required to configure FALCONEER software.

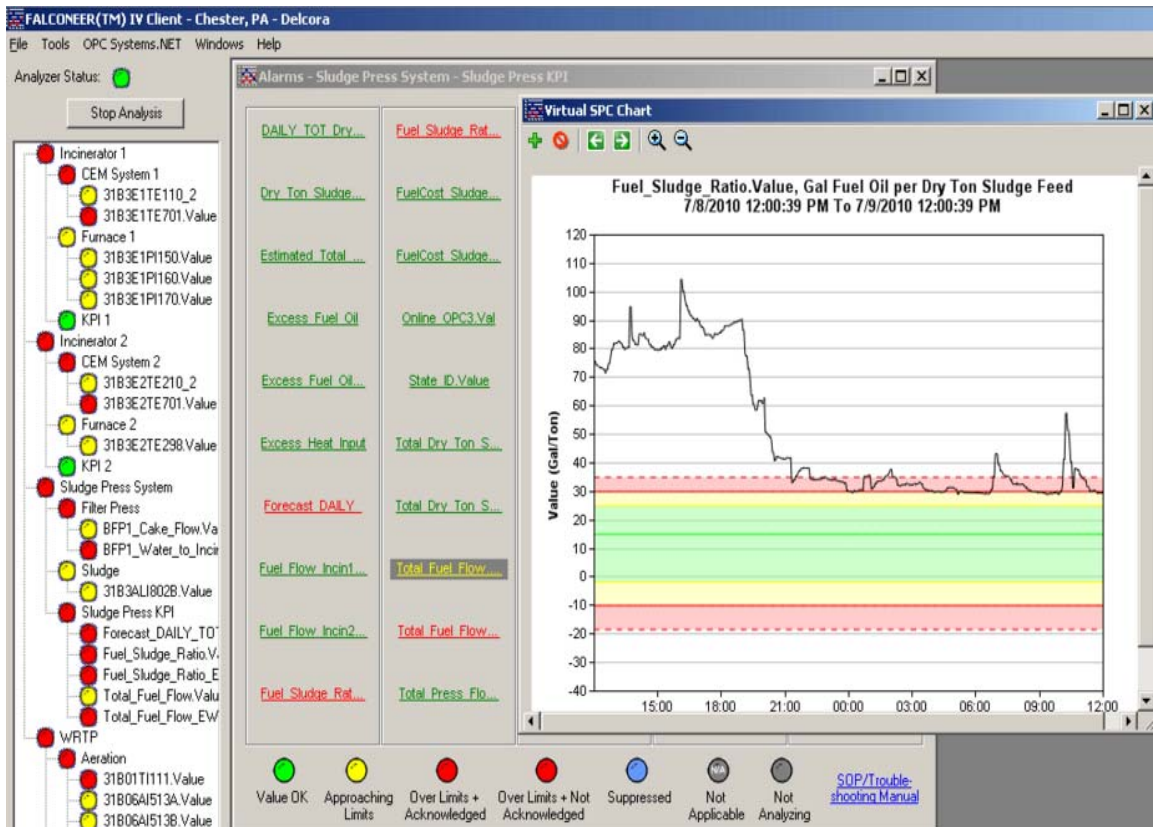


Figure 1

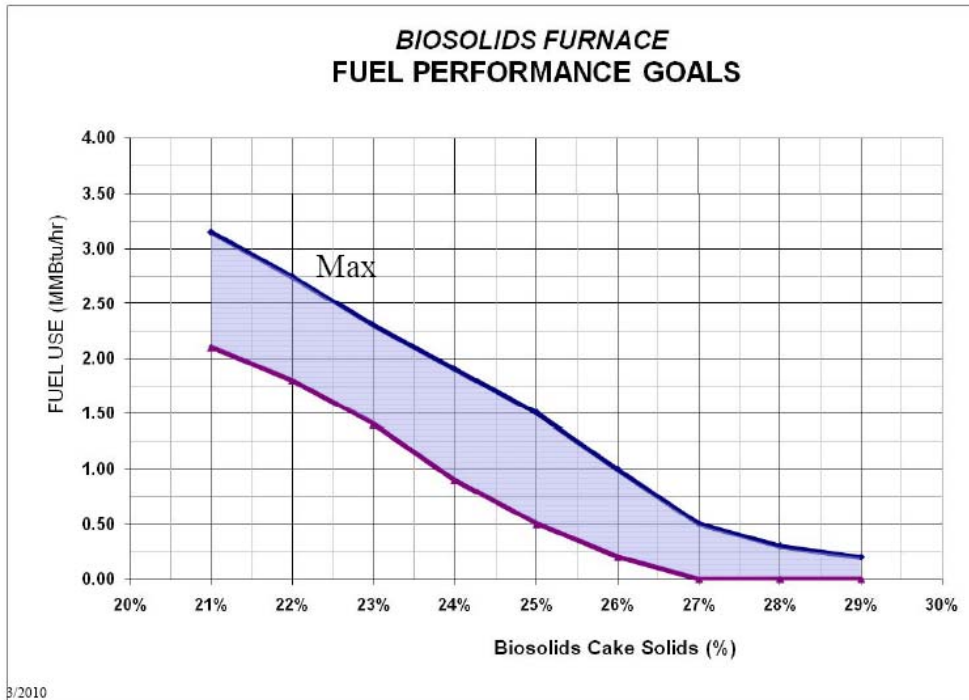


Figure 2

FALCONEER(TM) IV - Exception Report

IFCO-WSSC - IFCO-WSSC

6/6/2010 6:00 AM to 6/7/2010 5:59 AM

** Note: The Current Values column contains the trigger value of the alarm and was recorded when the alarm started. Further investigation of each alarm is recommended to determine the peak and average to over the alarm's duration.

State ID

NO ALARMS FOR THIS PERIOD

Fault Analysis - Models

NO ALARMS FOR THIS PERIOD

Fault Analysis - Calculated Variables

NO ALARMS FOR THIS PERIOD

Virtual SPC

Tag	Description	Status	Last Alarm Time	# of Alarms	Total Duration
Inciner1_CSJ_HeatHXFan%.Value	CSJ HX Fan Speed % (%)	Open	6/7/2010 5:49:21 AM	2	5:34:20
Inciner1_H2Temp.Value	Incinerator 1 Hearth 2 Temperature (DEGF)	Open	6/7/2010 5:47:22 AM	9	3:50:19
Inciner1_H1Temp.Value	Incinerator 1 Hearth 1 Temperature (DEGF)	Open	6/7/2010 5:14:21 AM	12	8:53:17
Start	End	Alarm Level	EWMA**	Limit Exceeded	
6/7/2010 5:14:21 AM		Red Low	1097.74	1100	
6/7/2010 3:05:22 AM	6/7/2010 4:18:21 AM	Red Low	1099.143	1100	
6/7/2010 1:18:22 AM	6/7/2010 2:10:22 AM	Red Low	1093.914	1100	
6/7/2010 12:37:21 AM	6/7/2010 1:01:22 AM	Red High	1253.978	1250	
6/6/2010 11:42:21 PM	6/6/2010 11:47:22 PM	Red Low	1098.904	1100	
6/6/2010 10:23:22 PM	6/6/2010 11:33:21 PM	Red Low	1096.912	1100	
6/6/2010 9:37:22 PM	6/6/2010 9:53:22 PM	Red Low	1099.295	1100	
6/6/2010 7:04:21 PM	6/6/2010 7:40:22 PM	Red Low	1096.028	1100	
6/6/2010 4:57:22 PM	6/6/2010 5:16:21 PM	Red Low	1098.177	1100	
6/6/2010 1:40:22 PM	6/6/2010 3:23:21 PM	Red Low	1097.82	1100	
6/6/2010 11:42:22 AM	6/6/2010 12:54:22 PM	Red Low	1091.82	1100	
6/6/2010 10:49:22 AM	6/6/2010 11:06:21 AM	Red High	1257.577	1250	

Figure 3

Executive Summary - Daily

Dates: 6/6/2010 6:00:00 AM to 6/7/2010 6:00:00 AM
 Generated for IFCO-WSSC - IFCO-WSSC by FALCONEER(TM)

Name	Description	Cur. Value	Units	Max. Severity
Incin1_Fuel_MMB TU.Value	Fuel Gas MMBTU	1.322	MMBtu	Green
Incin1_Fuel_MMB TU_Comparison.V	Fuel MMBTU Prediction Compared with Actual Fuel MMBTU	1.099	MMBtu	Red
Incin1_Fuel_MMB TU_Prediction.Val	Fuel MMBTU Prediction Based on % Solid	0.223	MMBtu	Green
Incin1_O2%.Value	Incinerator 1 Oxygen %	6.257	%	Red
Incin1_Sludge_%_ Solid.Value	Sludge Cake Percentage Solid	25.994	%	Yellow
Incin1_Wet_Ton_ Sludge.Value	Sludge Cake Feed Rate	8.805	GPM	Red

Figure 4

ITEMS	SHIFT				
	SHIFT A	SHIFT B	SHIFT C	SHIFT D	
Total Dry Ton Sludge Feed to Incinerator 1 & 2 (Ton)	2824.72	0.00	2824.72	2824.72	
Incinerator 1	Fuel Oil Usage (Gallon)	1393.11	0.00	1393.11	1393.11
	Fuel Sludge Ratio (Gal/Ton)	63.32	0.00	63.32	63.32
	Fuel Oil Cost per Ton Sludge (\$/Ton)	85.00	0.00	85.00	85.00
Incinerator 2	Fuel Oil Usage (Gallon)	1393.11	0.00	1393.11	1393.11
	Fuel Sludge Ratio (Gal/Ton)	63.32	0.00	63.32	63.32
	Fuel Oil Cost per Ton Sludge (\$/Ton)	83.83	0.00	83.83	83.83
Air Fan Blower	Total Electricity Cost	38.50	0.00	38.50	38.50
	Electricity Usage per Ton Sludge (\$/Ton)	12.40	0.00	12.40	12.40

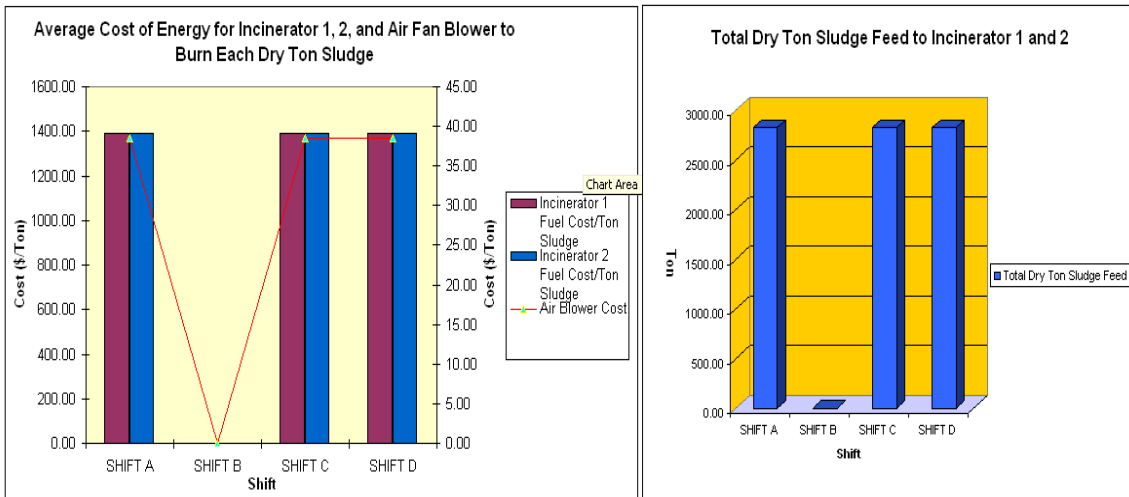


Figure 5