



**FALCONEER™ IV
PROCESS PERFORMANCE
SOLUTION:
ENHANCED MULTIPLE HEARTH
INCINERATOR OPERATIONAL
INTEGRITY with REAL-TIME COST
SAVING AUDITING & ADVISING**

Document Number: FT-09-0220



1 INTRODUCTION

1.1 FALCONEER™ IV REAL-TIME PROCESS PERFORMANCE SOLUTION

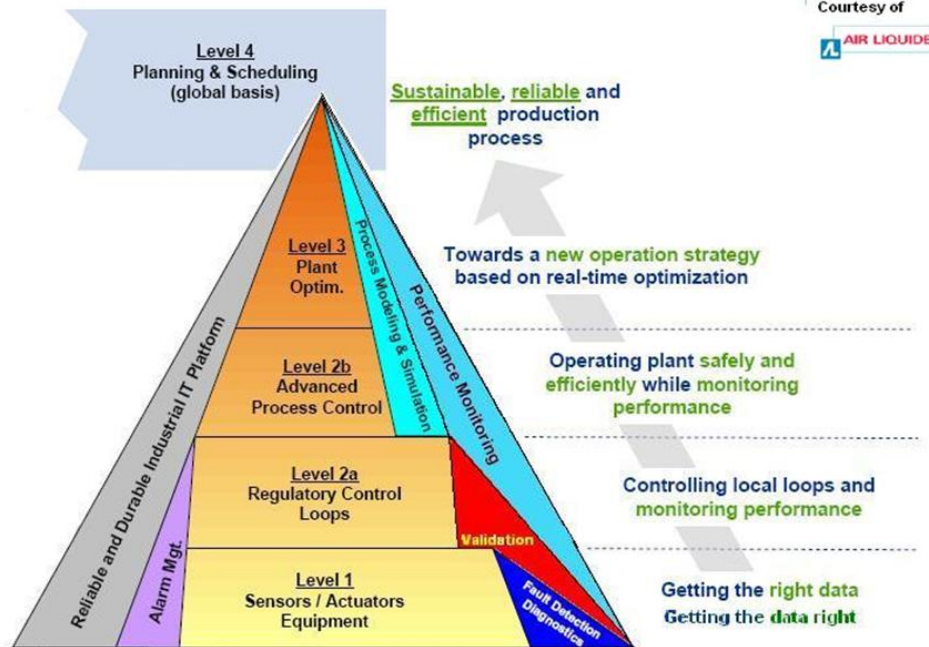
FALCONEER™ IV leverages the information used to design and operate the process with the real-time information from the process. FALCONEER takes the data from DCS and SCADA systems and adds “wisdom” or intelligence to the raw information. FALCONEER provides intelligence by using the plant’s process knowledge combined with the raw process data. FALCONEER comprehensively accounts for ALL process information by concurrently auditing & alerting at the highest, process-wide level as well as the individual sensor level. The key benefits of this performance auditing system should result in a more efficient plant, improved reliability and safety, and increased profitability. Real-time charts, advisory screens and reports will allow the engineer or supervisor to quickly review all the RIGHT information WHEN they need to look at it, resulting in time and efficiency savings. FALCONEER takes these tools that are normally used offline by these groups and incorporates them into a comprehensive online auditing and advisory suite. Identifying and/or preventing a single incident can often provide immediate payback with this solution.

DELCORA has invested in systems (DCS, Data Historians, Networks, PCs) to generate, collect and **save operational information while also using it to improve control** over their wastewater treatment facility. However, most of the time, this information is not used and simply wasted, thus **losing the opportunity to increase the ROI on this capital investment. FALCONEER™ IV’s intelligent real-time process performance software solution** can help manage all the information from the process to identify energy savings opportunities. Focusing on DELCORA’s system, several prime operational targets for DELCORA’s operation are 1) Fuel Cost Savings; 2) Higher, more consistent sludge feed; and 3) Real time statistical process control. In several incinerator systems, FALCONEER has looked at the cost of operation due to variable and/or below design operations, using Key Performance Indicators (KPIs) as part of the solution. The solution was designed to better identify energy and cost savings due to operational inefficiencies occurring in real-time. Once identified, the cause of the inefficiencies can be more readily corrected and/or controlled, leading to energy and cost savings.

DELCORA has already made significant improvements in instrumentation and controls and energy cost savings around their aeration basin blowers and waste water feed pumps. They are ready to take this improvement in information and control to the next level. FALCONEER™ IV pilot has demonstrated how this information will help DELCORA, initially with their incinerator operation, in the following ways:



Operational Performance - Production Processes



As DELCORA works toward improved operational integrity, reliability and capacity assurance will require a solution such as FALCONEER to move their control and process systems past Levels 1 & 2a. FALCONEER is a key component of all three plant or site levels!

DELCORA has sensors providing electronic data to control and data historians for use throughout the organization, they need to make sure they are getting the right data and getting the data right. Validation and Fault Analysis.

DELCORA has integrated these sensors into SCADA or DCS systems for regulatory closed loop control and are increasingly relying on these automated systems for Validation and Fault Analysis. In addition, a real-time virtual system providing Performance and Condition Monitoring and Advising becomes important to help the operators and engineers have and use the same knowledge consistently. Without these two strong foundations, advanced process control objectives (Level 2b) are difficult to achieve or never as reliable as they need to be for operations acceptance. Similarly, plant optimization (Level 3) and ultimately complete integration with all business and operation systems on a corporate basis will provide capabilities that FALCONEER provides.

- Provide real-time on-line monitoring of key dynamic performance indicators, such as energy/incinerator feed & fuel oil costs for saving operational costs



FALCONEER™ Process Performance Solution

- Provide real-time instrumentation validation & reconciliation to help save costs by avoiding unnecessary preventative maintenance instrumentation calibration
- Demonstrate systems capability to:
 - Provide timely alerts of pending sensor, equipment or process failures or abnormal conditions to avoid unscheduled shutdowns or capacity restrictions.
 - Avoid environmental release or process safety events from sensor or process failures
 - Validate sensor data & process information to help with control decisions and to meet environmental and safety reporting requirements
 - Monitor and advise on incinerator feed performance in order to identify and potentially avoid significant fluctuations to minimize use of second incinerator.

The suite comprises several modules providing continuous sensor and process validation and process performance auditing and optimization, sensor and process abnormal condition monitoring. Based on our experience, FALCONEER™ IV can help DELCORA **validate, insure, troubleshoot & optimize the safety and cost savings for their waste water treatment plant in a number of ways**, including:

- Monitoring operating conditions on fuel oil usage and air input can decrease variability in tons of sludge burned and increase in average tons of sludge burned.
 - Improvement on incinerator performance can help to increase the sludge feed to incinerator.
 - Can help to reduce the usage of operation both incinerator 1 and 2 at the same time due to overfeeding sludge.
 - Decreasing the number of times to operate two incinerators can help to save approximately \$9000 dollars per time. Reducing the number from currently 7-8 times per year to even just 2 times per year will provide a payback of \$45,000 to \$54,000 each
- Determining when excess fuel oil is occurring and then alerting operators for action can save several thousands of dollars per day (5-10% of annual cost) when the adjustments are made.
 - Burning grease will generate excess heat in the incinerators and with the heating value KPI on hearth level, operators can more likely make timely corrections when needed to decrease fuel oil.
 - This advisory alert can help reduce fuel oil usage per ton of sludge feed.
- Identifying periods of high excess air to the incinerator and adjusting saves both fuel oil costs on incinerator and electricity costs on the fan plus helps maximize waste heat recovery.
 - Excess air requires more fuel oil to reduce O2 levels to optimal %.
 - Cost savings may be available by reducing excess air by better control of fuel oil usage and amount of excess air input.
- Validating and reconciling flow meters from remote pump stations
 - Pump efficiency monitoring to identify and fix maintenance issues such as impellor problems, etc.
 - For direct customer billing, ensuring improved accuracy in billing and fee collection.
- Validating instrumentation and providing daily reports based on fault analysis for more timely identification of bad sensors.



FALCONEER™ Process Performance Solution

- Providing operational integrity for instrumentation and equipment used in automated systems such as the SRT system.
- Process optimization and targeting operational cost improvement after corrective actions based on the performance auditing results.
- Proactive and preventative actions based on performance auditing results will allow you to identify non-optimal conditions as they begin to occur or problems and failures as they are about to happen, and will allow for rapid corrective action that may prevent or mitigate the economic, environmental, and safety consequences.
- Validating sensor data & process information to help with control decisions and to meet environmental and safety reporting requirements
- Providing timely alerts of pending sensor, equipment or process failures or abnormal conditions to avoid unsafe operations or unscheduled shutdowns
- Troubleshooting time is reduced. Difficult problems, or multiple cause problems, are more readily diagnosed. Engineering, maintenance, and operations resources are focused where they are most needed and provide the biggest economic payback
- Saving costs from avoiding unnecessary preventative maintenance.
- Increased efficiency and minimization of high costs due to failing equipment.
- Reduction in the cost, time and resource commitment required to install and maintain your process performance application, thus allowing for a quick return on investment.
- Payback on the investment (ROI) of less than 2 years.