



Performance Tracking Plan

Project Number: XXXX-XX
 Building Name: XXX
 Provider Name: XXX
 Date Submitted: XXX

1.0 Project Summary

As a participant in the San Diego Retrocommissioning (RCx) Program, the XXX Building went through a retrocommissioning process to reduce energy consumption and optimize operations at the facility. Five RCx measures were implemented, and all work related to the RCx measures was completed by early XX 2008.

The conditioned area of the facility is XXX square feet, and includes mostly tenant suites that contain private offices, open office space, meeting rooms, and small data centers. All areas are conditioned with multi-zone, variable volume air handler units with hot water reheat terminal units. The two chillers are water-cooled centrifugals, and the heating water system includes three hot water boilers. The BAS is by Johnson Controls Metasys.

With funding from the Program, the performance of five measures will be tracked over the next year to verify persistence through analyzing trend data collected from the BAS. These five measures were selected based on their energy savings, ability to be monitored, and high potential for persistence problems.

The combined energy savings of the five tracked measures, estimated post-implementation and pre-tracking, represents 5.3% and 12% of the total electricity and gas savings, respectively.

RCx Measures Selected for Performance Tracking

The table below summarizes the RCx measures that have been selected for performance tracking, and the savings associated with each measure. All selected measures are currently monitored and trended by the BAS. The performance tracking capabilities of the BAS comply with the guidelines set by the Program.

#	Measure	Annual Electric Savings (kWh)	Annual Gas Savings (Therms)
2	Enable the waterside economizer	37,827	0
4	Program supply air temperature reset for all air handler units	10,883	0
5	Change operating schedule for the outside air fan	10,800	3,482
6	Change operating schedule for the general exhaust fan	5,278	0
7	Reduce VAV box minimum air flow setpoints	269,295	0



2.0 Performance Tracking System

The existing building automation system (BAS) is capable of trending all required data points at 15-minute intervals for extended time periods. The BAS is web-accessible, and the trend data will be obtained via remote Internet access. The Owner will give the PT Provider a password for read-only access of the BAS.

Monthly evaluations of trends and quarterly reporting will occur over the course of twelve months, and the Provider will assist the building owner and staff in determining the cause of any issues found as a result of trending. The Provider will also suggest potential solutions.

3.0 Installation / Implementation of Performance Tracking System

The existing BAS is web-based, and the owner has granted read-only permission to the Provider so that all required measure points can be reviewed, downloaded, and analyzed remotely. Therefore, no equipment installation is required for performance tracking to begin.

4.0 Budget

The total budget for the tracking system is \$XX,XXX.

Tracking System Set-Up Budget

Provider Labor: Analyze BAS system and ensure that all required points are included before monitoring begins. Set-up monitoring system. Points may be added if necessary.

	Hourly rate	# of hours	Total cost
Senior Engineer	\$ X	X	\$ XX
Project Manager	\$ X	X	\$ XX
Travel/Installation expenses			\$ XX
Monitoring Equipment and Software			\$ XX
Subcontractor cost			\$ XX
TOTAL			\$XXXX

Ongoing Tracking Budget

Provider Labor: X engineering hours each month beginning January 1, 2009, for 12 months.

	Hourly rate	# of hours	Total cost
Senior Engineer	\$ X	X	\$ XX
Project Manager	\$ X	X	\$ XX
TOTAL			\$ XXX



5.0 Problem Resolution

The control system screens and trend data for the measures covered by this performance tracking plan will be reviewed on a monthly basis to identify potential problems with persistence. The specifics on what constitutes a “red flag” are described in the table below for each measure.

Problems will be communicated to the building staff in a timely manner, and the Provider may guide the owner/building staff in resolving the problem, as budget allows. If it is unclear if an issue is indeed a problem, the measure will continue to be monitored closely. However, all problem resolution will be the responsibility of the building owner and staff.

#	Measure	Points to Track	Flag to Issue
2	Enable the waterside economizer.	<ul style="list-style-type: none"> • Cooling Tower Fans • Chiller Power • Cooling Tower Fan Power • Outside Air dry bulb and wet bulb temperatures • Chilled Water supply and return Temperatures (including supply setpoint) • Condenser water Pump speeds • Cooling Tower Fan speeds • Condenser water supply and return temperatures (including supply setpoint) 	<ol style="list-style-type: none"> 1. When cooling tower is not meeting setpoint 2. When cooling tower is not operating correctly 3. If setpoints are not set properly 4. When overrides occur 5. Failures for pumps, valves, and fans 6. Insure balance between AHU fan power and Cooling tower power 7. Insure balance between switch over CT Fan kW vs. Chiller kW 8. When chiller operates at outside air temperatures above 55°F.
4	Program supply air temperature reset for all air handler	All air handler supply air setpoints, temperatures, and valve positions.	<ol style="list-style-type: none"> 1. When Overrides occur 2. If reset is not tuned properly 3. If reset is not working within limits 4. If setpoint and temperature have errors or too much offset
5	Change operating schedule for the outside air fan	Fan Status and schedule	<ol style="list-style-type: none"> 1. If fan runs when it is not needed
6	Change operating schedule for the general exhaust fan	Fan Status and schedule	<ol style="list-style-type: none"> 1. If fan runs when it is not needed
7	Reduce VAV box minimum air flow setpoints	VAV damper position, CFM setpoint, CFM, and room temperature. For 3 VAV boxes per floor	<ol style="list-style-type: none"> 1. If VAV CFM is not being met 2. If CFM is not enough or too little to meet room load 3. If room temperatures are out of specifications 4. If VAV minimum airflow setpoints are changed from those implemented during the RCx project



6.0 Timeline / Deliverables

The Provider will report quarterly to the San Diego RCx Program and owner, by issuing quarterly reports which will summarize all issues found. In addition to these quarterly reports, the Provider will generate a final report summarizing the overall findings of the performance tracking activities. Below is a table indicating due dates for all deliverables to the Program:

Project Schedule:

Item	Date(s)
Planning meeting	2/16/09
Quarter 1: Performance tracking	03/1/09-05/31/09
Quarter 1 Performance Tracking meeting	06/15/09
Quarter 2: Performance tracking	06/01/09-08/31/09
Quarter 2 Performance Tracking meeting	09/15/09
Quarter 3: Performance tracking	09/01/09-11/30/09
Quarter 3 Performance Tracking meeting	12/15/09
Quarter 4: Performance tracking	12/1/09-02/28/10
Quarter 4 Performance Tracking meeting	03/15/10
Wrap-up Meeting	03/15/10

Deliverable Schedule:

Deliverable	Due date
Submission of <i>Performance Tracking Plan</i>	11/09/08
Submission of first <i>Quarterly Report</i>	06/10/09
Submission of second <i>Quarterly Report</i>	08/10/09
Submission of third <i>Quarterly Report</i>	12/10/09
Submission of fourth <i>Quarterly Report</i>	03/10/10
Submission of <i>Final Report</i>	03/10/10