

# Perspectives From the Field

## Making a Case for On-Going CX



# *Current Energy Management Climate*

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- Buildings are Becoming More Sophisticated
  - Equipment, Systems, Controls Integration
- Landscape is Changing Rapidly
  - Traditional Energy Management Practices Are Losing Efficacy
  - Domains of Responsibility for Energy Management Strain Capacity
    - Energy Markets, Discourse Knowledge, Programs/Policy, Technology, Mission/Vision
- A Full Time Energy Professional Is Not a Practical Solution for Many Companies
  - Economic Factors, Breadth of Required Knowledge, Industry Transformation
- The Integration of Technology and Action Can Result in the Development of an Ongoing Program for Building Performance Optimization

# Capabilities for On-Going CX

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- What is needed to make on-going CX successful?
  - Once a system is in place that can monitor the concerns of the client: Need competent resources to turn the data into action
- Communication – “*The coordinated behaviors or actions mutually triggered among the members of a social interaction*”
- We assert that the current modes of monitoring for on-going CX are not effectively *communicating* with the recipient of the data
- All the data in the world is worthless without competent action as a result
- What is needed?
  - Effective, technically savvy in-house building performance engineers
  - Competent outside partner to interpret and respond to the monitoring data
- Result: No acute RCX efforts as part of on-going operations

# *Stories from the Field*

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## Who are the Good Candidates From Our Experience?

1. Poor Candidate: Severe Deferred Maintenance, Lack of Control/Monitoring, Pedestrian In-House Operations Staff
  
2. Good Candidate: Prudent Institutionalization of an Energy Plan
  - a) RCX ➡ Capital Improvements ➡ Asset Planning ➡ Continuous CX

# *Stories from the Field*

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## Good Candidate:

- Hospital Campus (1 million sqft.)
- Combination of Old and New Buildings (1890 – 2005)
- RCX Derived \$530,000 in Annual Savings
- Controls, Monitoring, and PM Plan Transformed Through a Vision for On-Going CX

# Stories from the Field

## Good Candidate: Performance Monitoring

	2007	2008	2009	2007	2008	2009
	HDD	HDD	HDD	CDD	CDD	CDD
January	828	926	1,140	0	0	0
February	1,039	810	798	0	0	1
March	630	658	712	0	0	6
April	424	298	372	0	3	56
May	74	184	154	87	23	134
June	1	17	42	259	278	226
<b>Totals to Date</b>	<b>2,996</b>	<b>2,893</b>	<b>3,218</b>	<b>346</b>	<b>304</b>	<b>423</b>

Electric Use Per DD (To Date)

Year	DD	kWh	kWh/DD
2,007	3,342	9,091,950	2,721
2,008	3,197	8,979,600	2,809
2,009	3,641	8,404,200	2,308

Natural Gas Use Per DD (To Date)

Year	DD	Therms	Therms/DD
2,007	3,342	461,087	138
2,008	3,197	443,018	139
2,009	3,641	454,144	125

# *Stories from the Field*

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Good Candidate: Field Conditions



# *Stories from the Field*

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## Poor Candidate:

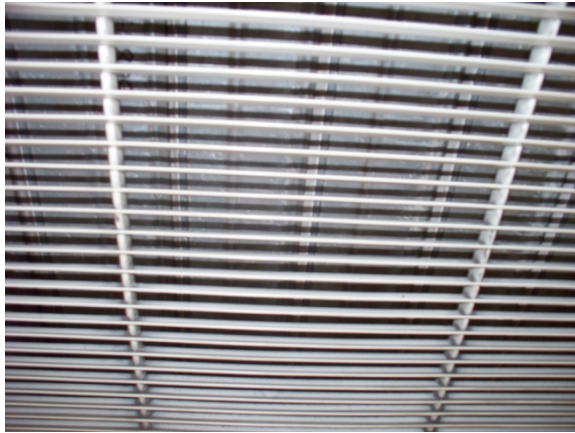
- University Building (Campus)
- Severe Deferred Maintenance
- RCX Mandatory to Assess Base Building Capacity
- Capital Improvements in the \$10+ Million Range for Prudent Operation
- On-Going CX Would be Imprudent
- OCX infrastructure to be integrated into capital improvement solution

<u>Unit</u>	<u>Supply Static P (in.WC)</u>	<u>Return Static P (in.WC)</u>	<u>Tested Supply CFM</u>	<u>Design Supply CFM</u>	<u>Tested Return CFM</u>	<u>Design Return CFM</u>	<u>Calculated OA CFM</u>	<u>Design OA CFM</u>	<u>Note</u>
AHU1	2.00	-	26,963	82,000	9,520	14,000	17,443	68,000	
AHU2	1.75	(0.10)	46,757	70,000	31,320	34,200	15,437	35,800	
AHU3	2.25	(1.00)	18,608	29,000	11,657	18,700	6,951	10,300	
AHU4	3.50	(0.25)	11,397	54,000	-	18,000	11,397	36,000	Supply static in single leg with no flow. FSD in RA Duct fully closed allowing no RA.
AHU5	N/A	N/A	N/A	60,000	N/A	14,000	N/A	46,000	No testing due to access. Suspect no flow to major branches. Inspection indicates significant FSD failures.
AHU6	-	-	2,079	6,100	6,540	4,600	-	1,500	Higher than expected RA flow. 0% OA. Excess RA to Spill.
AHU7	0.60	-	4,167	20,000	-	16,000	4,167	4,000	RA Damper to mixing box fully closed.
AHU8	N/A	N/A	N/A	9,000	N/A	7,500	N/A	1,500	No test due to access.
AHU9	2.00	(0.05)	4,655	10,000	3,544	8,500	1,111	1,500	
AHU10	1.00	(0.55)	5,600	15,000	8,832	12,500	-	2,500	No OA. Excess RA to Spill.
<b>Total:</b>			<b>120,225</b>	<b>355,100</b>	<b>71,413</b>	<b>148,000</b>	<b>56,506</b>	<b>207,100</b>	
<b>Variance:</b>			<b>(234,875)</b>		<b>(76,587)</b>		<b>(150,594)</b>		

# *Stories from the Field*

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Poor Candidate:



# *Stories from the Field*

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- Site Conditions Look the Same
  - Ubiquitous Mechanical and Control Issues
- It's what is going on in the background that makes the situations Good or Poor
- Problems in the field are the tip of iceberg
- Once corrected, what is the infrastructure capacity and cultural climate to ensure operational excellence
- Problems are systemic, not componential
- It is a way of being, not a technical solution!

# *Mandated Periodic Re-Commissioning*

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- What will it be like if there is Mandatory, Periodic Re-Commissioning?
  - Lots of performance contractors will be revising their business plans
  - Higher performance buildings
  - Longer MTBF
  - Achieve effective working life
  - Buildings run like race cars



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