Performance and Results (updated on 6/24/2014)

Building	Units	Faults	Occurrence	Data Period (days w/ sufficient raw data)
LBNL	RTU 1	System Off for the Day Short Cycling 2.3% Degradation	25 days 73 days No degradation	9/12-6/24 (236 days)
LBNL	RTU 2	System Off for the Day Short Cycling 1.7% Degradation	38 days 66 days No degradation	9/12-6/24 (224 days)
LBNL	RTU 3	System Off for the Day Fan Cycling only with Compressor Short Cycling 1.1% Degradation	37 days 2 days 5 days No degradation	9/12-6/24 (230 days)
LBNL	RTU 4	System Off for the Day Fan Cycling only with Compressor Short Cycling 4.2% Degradation	29 days 1 day 26 days No degradation	9/12-6/24 (231 days)
LBNL	RTU 5	System Off for the Day Short Cycling 1.3% Degradation	27 days 1 day No degradation	9/12-6/24 (252 days)
LBNL	RTU 6	System Off for the Day Short Cycling 1.1% Degradation	40 days 2 days No degradation	9/12-6/24 (232 days)
LBNL	RTU 7	System Off for the Day Short Cycling 2.2% Degradation	11 days 40 days No degradation	9/12-6/24 (216 days)

Performance and Results (updated on 6/24/2014)

Building	Units	Faults	Occurrence	Data Period (days w/ sufficient raw data)
PNNL	RTU 1	System Off for the Day Short Cycling 0% Degradation	4 days 73 days Not enough cooling	9/12-6/24 (130 days)
PNNL	RTU 2	System Off for the Day Short Cycling 0% Degradation	3 days 66 days Not enough cooling	9/12-6/24 (182 days)
PNNL	RTU 3	System Off for the Day Fan Cycling only with Compressor Short Cycling 0% Degradation	5 days 2 days 5 days Inconclusive Data	9/12-6/24 (237 days)
PNNL	RTU 4	System Off for the Day Fan Cycling only with Compressor Short Cycling 0% Degradation	3 days 1 day 26 days Inconclusive Data	9/12-6/24 (143 days)

Sample SMDS User Interface Screens

Smart Monitoring + Diagnostic System
funded by DOE

User

June, 2014

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30					

Buildings

- LBL, Berkeley, CA
- TWT, Seattle, WA

RTU	Operation Status	Performance Degradation
RTU1	OK	No Degredation Found System is runing OK
RTU2	Short Cycling More Details	No Degredation Found System is runing OK
RTU3	OK	No Degredation Found System is runing OK
RTU4	OK	No Degredation Found System is runing OK
RTU5	OK	No Degredation Found Inconclusive Data
RTU6	OK	No Degredation Found System is runing OK
RTU7	OK	No Degredation Found System is runing OK

Smart Monitoring + Diagnostic System

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Welcome,
userA

April, 2013

Mo	Tu	We	Th	Fr	Sa	Su
25	26	27	28	29	30	31
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	1	2	3	4	5

Buildings

- BuildingA, Portland, OR
- BuildingB, Seattle, WA
- BuildingC, Seattle, WA

« all systems

Operation Status | Performance Degradation

RTU1

April 16th, 2013 Tuesday

Operation Status: Short Cycling

Short Cycling

Short cycling occurs whenever an RTU compressor is on for a shorter time than the minimum on-time specified by the manufacturer before tuning off or off for a shorter time than the minimum off-time specified by the manufacturer before turning on again.

Impact on Energy Consumption and System Operation

Short cycling may impact equipment lifetime by wear associated with cycling equipment excessively. To the extend that RTU efficiency is lower during start-up and shutdown transient operation than at steady state, short cycling will increase the overall energy consumption as the fraction of time spent in transient operation increases for shorter cycles.

Smart Monitoring + Diagnostic System

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Welcome,
userA

April, 2013

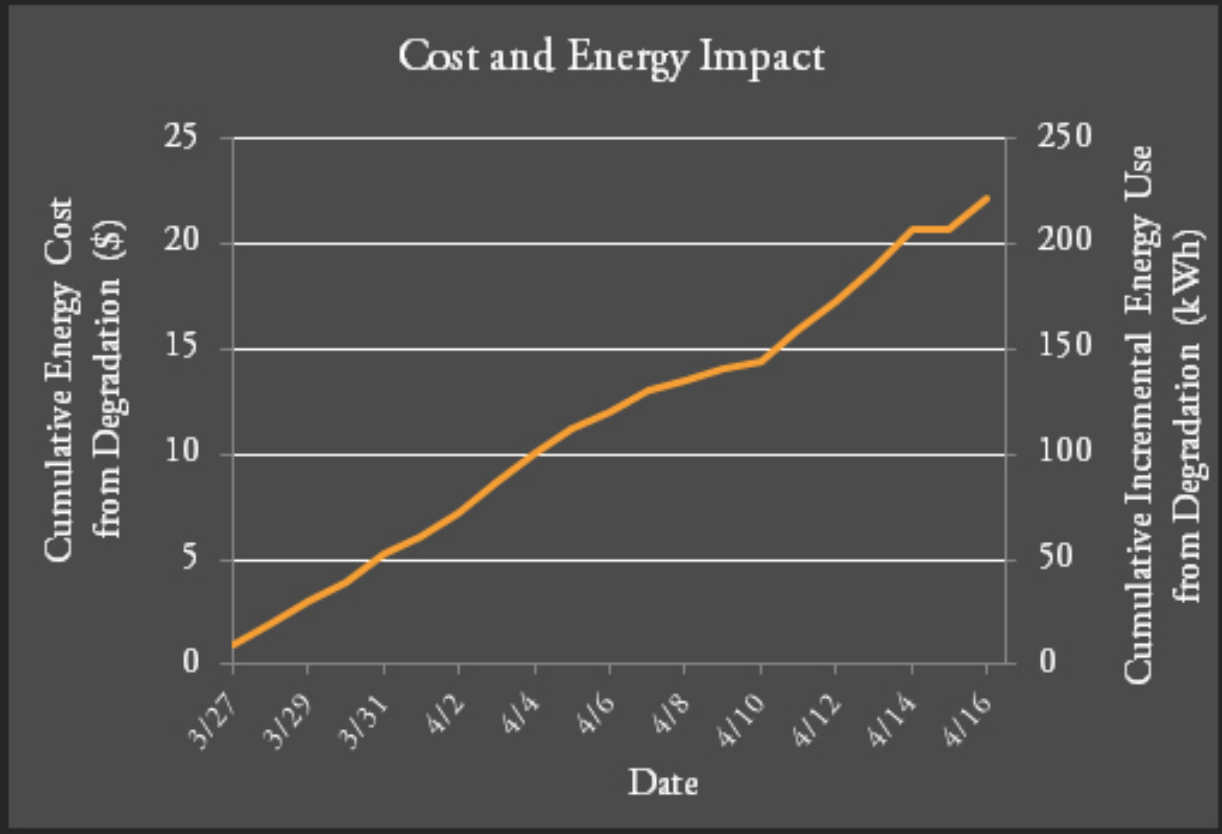
Mo	Tu	We	Th	Fr	Sa	Su
25	26	27	28	29	30	31
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	1	2	3	4	5

Buildings

- BuildingA, Portland, OR
- BuildingB, Seattle, WA
- BuildingC, Seattle, WA

« all systems

Operation Status | Performance Degradation

RTU3

March 27th -- April 16th, 2013
Performance Degradation: 12%
Cumulative Energy Cost: $22.2