

2024 Critical  
Environments Summit

# Life Sciences Facility Management and Services Best Practices

Fred Hutch Cancer Center

Steve Matthes and Seth Thornton, January 17, 2024



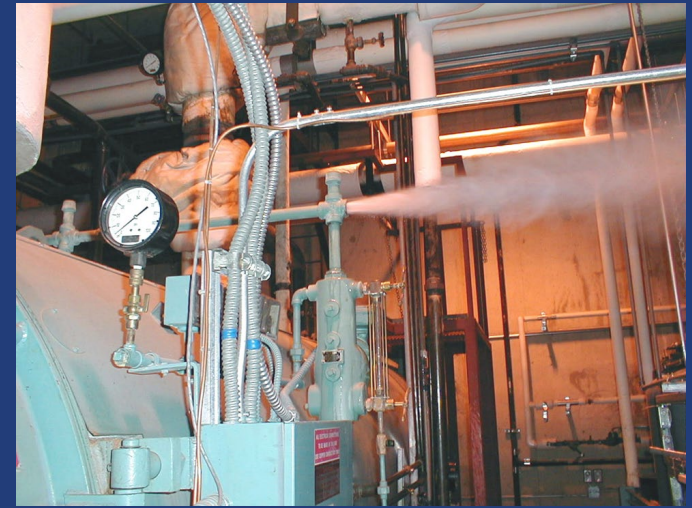
- 1 Arnold
- 2 Eastlake
- 3 Fairview
- 4 Hutchinson
- 5 Steam Plant
- 6 Thomas
- 7 Weintraub
- 8 Yale
- 9 Clinic



**ADDRESS:** 1100 Fairview Ave.N. | P.O. Box 19024 | Seattle, WA 98109-1024

# Best Practices for Critical O&M

#1 Focus on more than just keeping the old stuff running



# Best Practices for Critical O&M

"Many changes don't happen until the maintenance foreman, who knows how to keep the old equipment running, **DIES** or **RETIRES**."

- Peggy Podolak

Senior Industrial Energy Analyst at the Department of Energy

<http://ngm.nationalgeographic.com/2009/03/energy-conservation/miller-text/7>



# Best Practices for Critical O&M

Big things to focus on include:

Fault Detection Diagnostics

Predictive Analytics

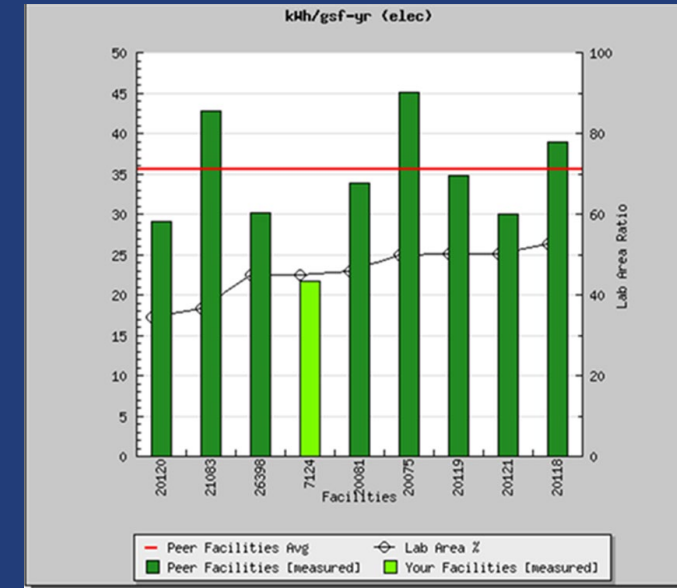
Benchmarking

KPIs

Customer Service

Emergency Operations

Recruitment/Retention/Succession Plans



# Best Practices for Critical O&M

#2 If you don't have a good Plan B, you better have a good resume



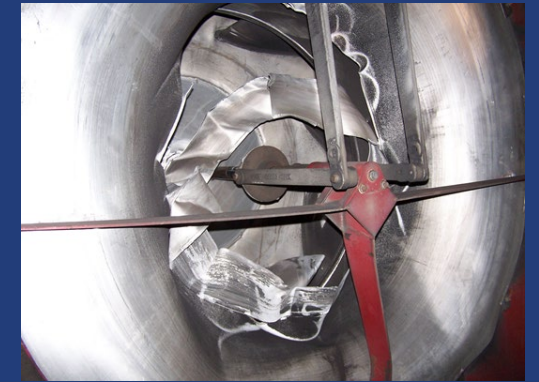
# Best Practices for Critical O&M

Critical Operations must have backup plans and redundancy. Failure is not an option!



# Best Practices for Critical O&M

#3 Replace equipment 1 year too early as opposed to 1 day too late





# Best Practices for Critical O&M

Keep track of the:

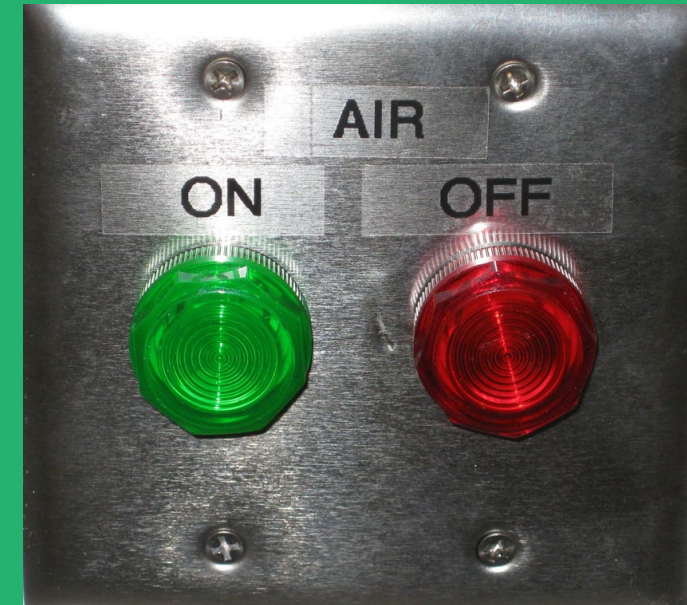
- Age
- Runtime
- Repair History
- Manufacturer Recommendations
- Cost of Failure
- Obsolescence
- Rebate/Incentive Options

Use it to justify pre-failure replacement



# Best Practices for Critical O&M

#4 Send just the right amount of energy to just the right place for just the right amount of time



Legend ← →  
Outside Air DB/RH/DWPT 37.8 °F / 94.3 % / 36.3 °F

# Home

- HOME
- AIR
- WATER
- FLOORPLANS
- SUMMARIES



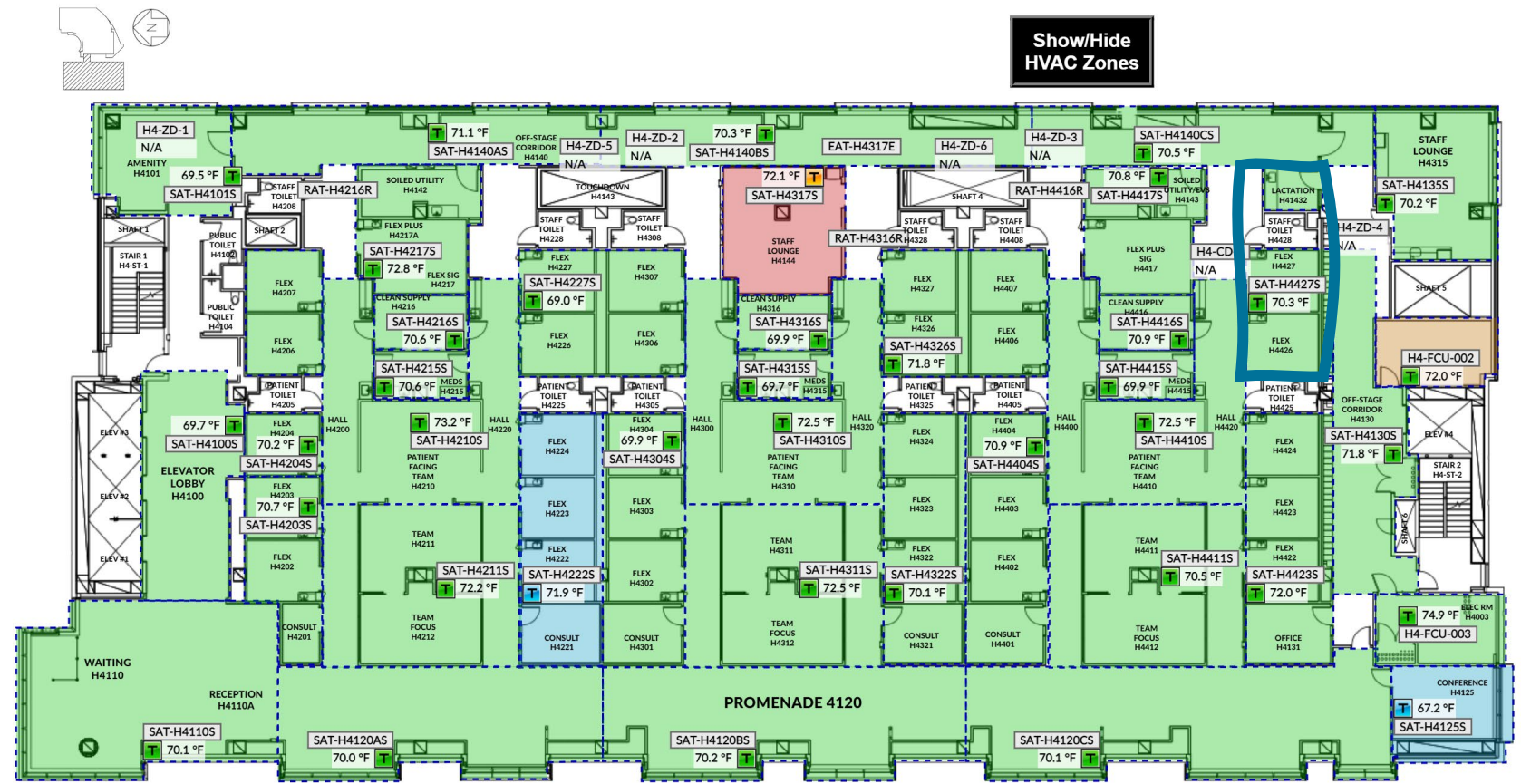
Legend ← →  
Outside Air DB/RH/DWPT 37.8 °F / 94.6 % / 36.3 °F

# Level 4

- HOME
- AIR
- WATER
- FLOORPLANS
- SUMMARIES



Show/Hide HVAC Zones

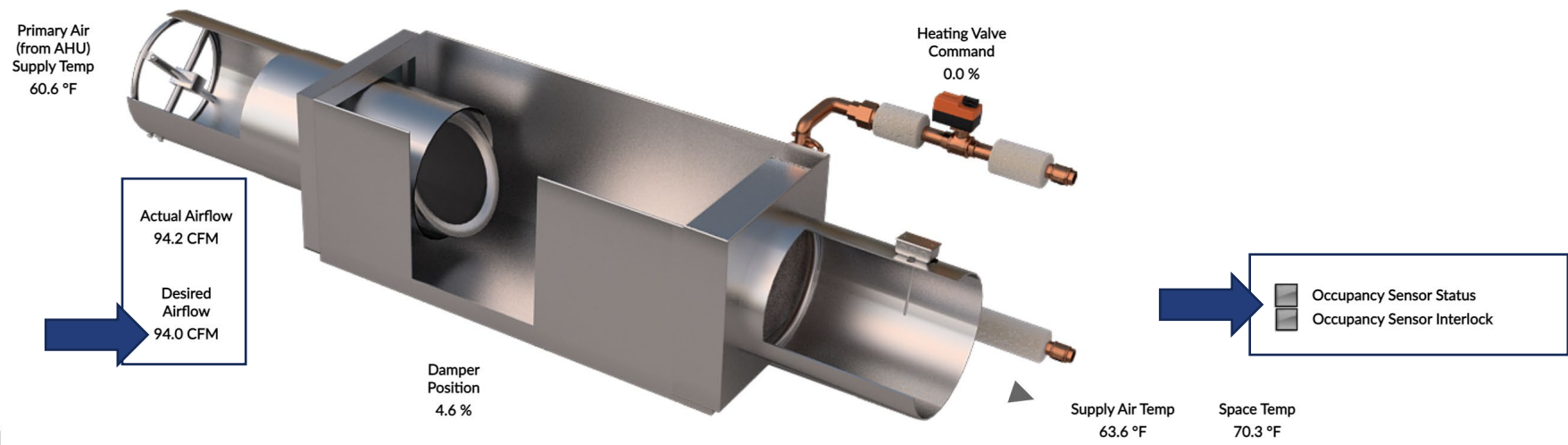


Legend    
 Outside Air DB/RH/DWPT 37.8 °F / 94.2 % / 36.3 °F

# SAT-H4427S



-  HOME
-  AIR
-  WATER
-  FLOORPLANS
-  SUMMARIES



- Occupancy Sensor Status
- Occupancy Sensor Interlock

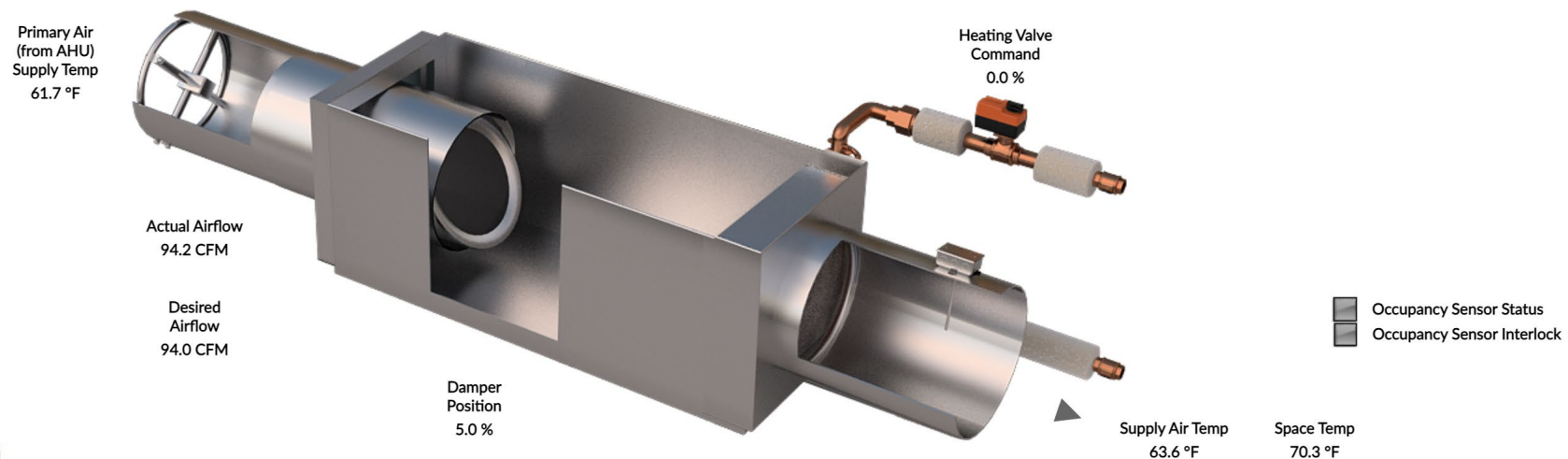
General		Advanced Settings	
<b>Setpoints</b>			
72.0 °F	Occupied Setpoint		
71.0 °F	Occupied Setpoint Low Limit		
73.0 °F	Occupied Setpoint High Limit		
1.0 °F	Occupied Heating Offset		
2.0 °F	Occupied Cooling Offset		
55.0 °F	Unoccupied Heating Setpoint		
85.0 °F	Unoccupied Cooling Setpoint		
281.0 CFM	Minimum Heating Airflow		
295.0 CFM	Maximum Heating Airflow		
281.0 CFM	Minimum Cooling Airflow		
295.0 CFM	Maximum Cooling Airflow		
<b>Alarm Setpoints</b>			
5.0 °F	Space Temp Too Low Below SP		
5.0 °F	Space Temp Too High Above SP		
15.0 min	Space Temp Alm Timer		
25.0 CFM	Maximum Airflow Error SP		
15.0 min	Airflow Out of Range Alm Timer		
<b>Alarms</b>			
<input type="checkbox"/>	Global Shutdown Mode	<input type="checkbox"/>	Summary Alarm
<input type="checkbox"/>	Load Shed Setback	<input type="checkbox"/>	Space Too Cold Alarm
<input checked="" type="checkbox"/>	Persistent Comm. Failure	<input type="checkbox"/>	Space Too Warm Alarm
		<input type="checkbox"/>	Failed Space Sensor
		<input type="checkbox"/>	Failed DAT Sensor
		<input type="checkbox"/>	Airflow Out of Range Alarm
<b>Control Mode</b>			
<input checked="" type="checkbox"/>	Master Allow	<input checked="" type="checkbox"/>	Occupied Mode
		<input type="checkbox"/>	Warmup Mode
68 °F	Current Heating Setpoint	<input type="checkbox"/>	Cooldown Mode
77 °F	Current Cooling Setpoint	<input type="checkbox"/>	NSB Heating Mode
0 %	Heating Signal	<input type="checkbox"/>	NSB Cooling Mode
0 %	Cooling Signal	<input type="checkbox"/>	Group Override
		<input type="checkbox"/>	Afterhours Mode
		0 min	Afterhours Timer
		0 min	Remaining Time

Legend ← →  
Outside Air DB/RH/DWPT 37.7 °F / 94.2 % / 36.3 °F

# SAT-H4427S



- HOME
- AIR
- WATER
- FLOORPLANS
- SUMMARIES



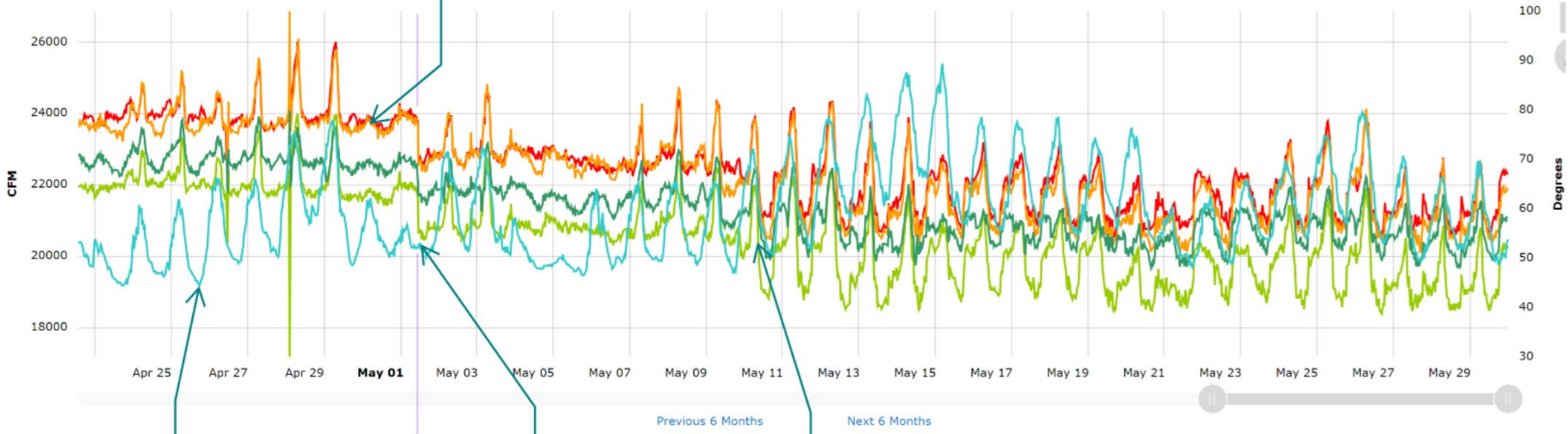
General	Advanced Settings
<p><b>Damper Control</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> OFF : Lock Damper Motion</li> <li><input type="checkbox"/> OFF : Force Minimum CFM</li> <li><input type="checkbox"/> OFF : Force Maximum CFM</li> <li><input type="checkbox"/> OFF : Force Damper Full Close</li> <li><input type="checkbox"/> OFF : Force Damper Full Open</li> </ul>	
<p><b>System Configuration</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> OFF : Exclude Unit Global Counts</li> <li>0.0 min : Afterhours Limit</li> <li><input type="checkbox"/> OFF : Allow CO2 Sensor</li> <li><input type="checkbox"/> ON : Allow Heating Valve</li> <li><input type="checkbox"/> OFF : Allow Humidity Control</li> <li><input type="checkbox"/> ON : Allow Occupancy Sensor Influence</li> <li>10.0 min : Occupancy Sensor Timer</li> <li>3.0 °F : Vacant Temperature Offset</li> <li>94.0 CFM : Vacant Airflow Setpoint</li> </ul>	
<p><b>Heating</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> OFF : Enable Manual Heating Valve Position</li> <li>0.0 % : Manual Heating Valve Position</li> </ul>	

Save

Night of 5/1 total airflow ~92,000.  
Night of 5/28 total airflow ~81,500.  
That's about an 11% percent drop.

Building Ariflow (100000.MT14)

Left: 106030.Supply\_Total\_Airflow 106010.Supply\_Total\_Airflow 106040.Supply\_Total\_Airflow 106020.Supply\_Total\_Airflow  
Right: OSA\_Temp\_Input



Unoccupied and occupied flows were the same.  
Airflow only increased based on warm temps

Blue line is OSA Temp

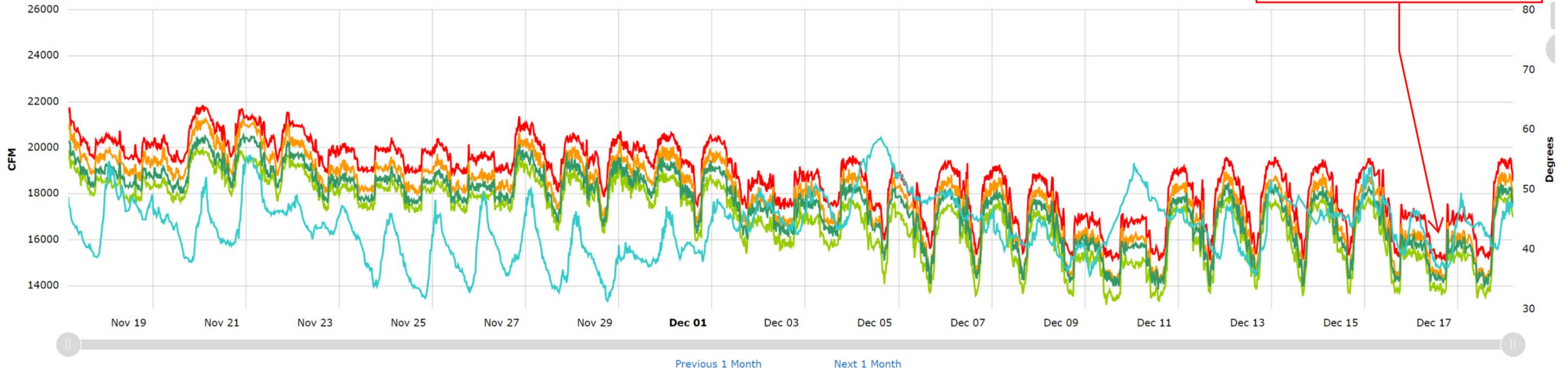
On 5/1, implemented unoccupied mode based on lighting control sensor feedback for 2nd floor only and saw big drop at 10 pm when nightly shutdown of lights happens.

Implemented airflow set back for the rest of the building (except 5th floor) on 5/10 and really started seeing much lower nightly airflow set backs.

Night of 5/1 total airflow ~92,000.  
Night of 5/28 total airflow ~81,500.  
Night of 12/17 total airflow ~58,000.

Building Ariflow (100000.MT14)

Left: 106030.Supply\_Total\_Airflow 106010.Supply\_Total\_Airflow 106040.Supply\_Total\_Airflow 106020.Supply\_Total\_Airflow  
Right: OSA\_Temp\_Input 106010.SDSP\_SP\_Curr\_Value 104035.AF\_Calc





# Best Practices for Critical O&M

1. Focus on more than just keeping the old stuff running
2. Have a great Plan B...and Plan C... and Plan D....
3. Replace equipment 1 year too early versus 1 day too late
4. Send just the right amount of energy to just the right place for just the right amount of time



Thank You!

Questions?