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3M



“Sash-to-Save”

3M

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Driven to DiscoverSM

3M Overview



- 76,000 employees
- 56,000 products
 - adhesives, abrasives, laminates, electronic circuits and optical films
- Operates in 60 countries
- Products available in 200 countries
- Sales of \$23.1 billion in 2009

Motivations for Change

- 3M Center has the highest energy cost of any 3M location.
- 50% for HVAC in labs

Problem Background

- Many labs have excess exhaust and wasted energy.
 - Fume hoods are always on
 - Fume hoods often underutilized

Possible Solutions Examined by 3M

- Installing on/off switches
- Decommission hoods when not in use
- Installing Variable Air Volume Systems
- Close Hood Sashes

Installing on/off switches

- Pros
 - Employees can turn off the hoods
- Cons
 - On/off switch may cause safety problems

Decommission fume hoods when not in use

- Pros
 - Save energy when hoods are turned off
 - Potentially create leverage for upgrades
- Cons
 - Too time consuming
 - Re-commissioned hoods continue to run inefficiently
 - Potential cost of upgrades

Installing Variable Air Volume Systems

- Pros
 - Decreased energy consumption
- Cons
 - Cost of installation
 - Divisions that are in charge of the labs have no incentive to update their ventilation system

Close Fume Hood Sashes when not in use

- Pros
 - Decreases energy consumption
 - Implementation cost
- Cons
 - Actually getting people to close their hoods when not in used

“Sash-to-Save” Program

- Uses social marketing to encourage people to close their fume hood sashes when not in use.



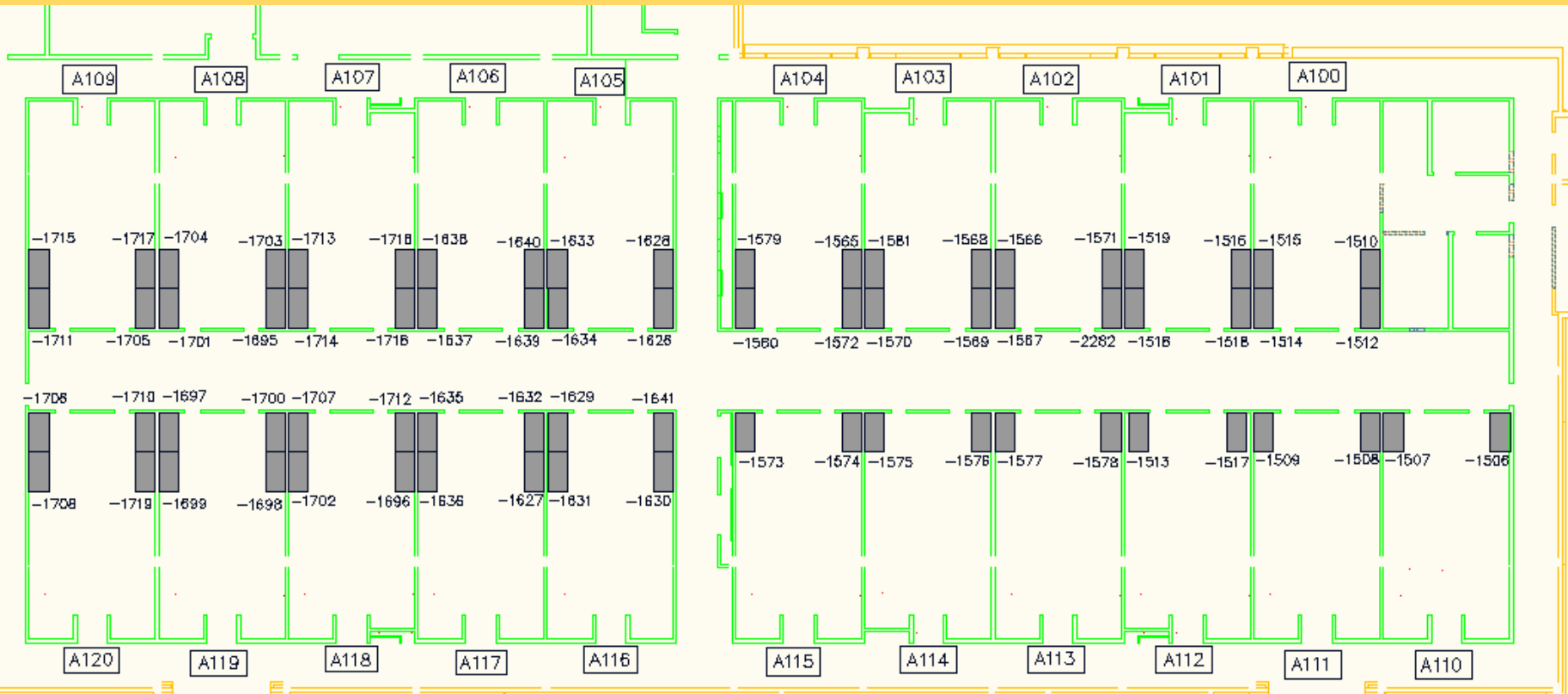
Approach

- Survey every fume hood at 3M Center
 - 1800 hoods total
 - 1300 for this project
- Gather several pieces of information
 - Hood location
 - Vertical or horizontal?
 - An estimation of use
 - Never, Rarely, Some, or Frequently
 - Open or closed?
- Enter all of that information into a database.

Approach (cont.)

- Create “audit routes”
 - Roughly 80 routes total
 - Volunteer auditors check whether hoods are open or closed
 - To be done either before or after hours.
 - Should not take no longer than 15 minutes to complete
 - Each “audit route” will followed once every 2-3 weeks.
 - A database will analyze and distribute results

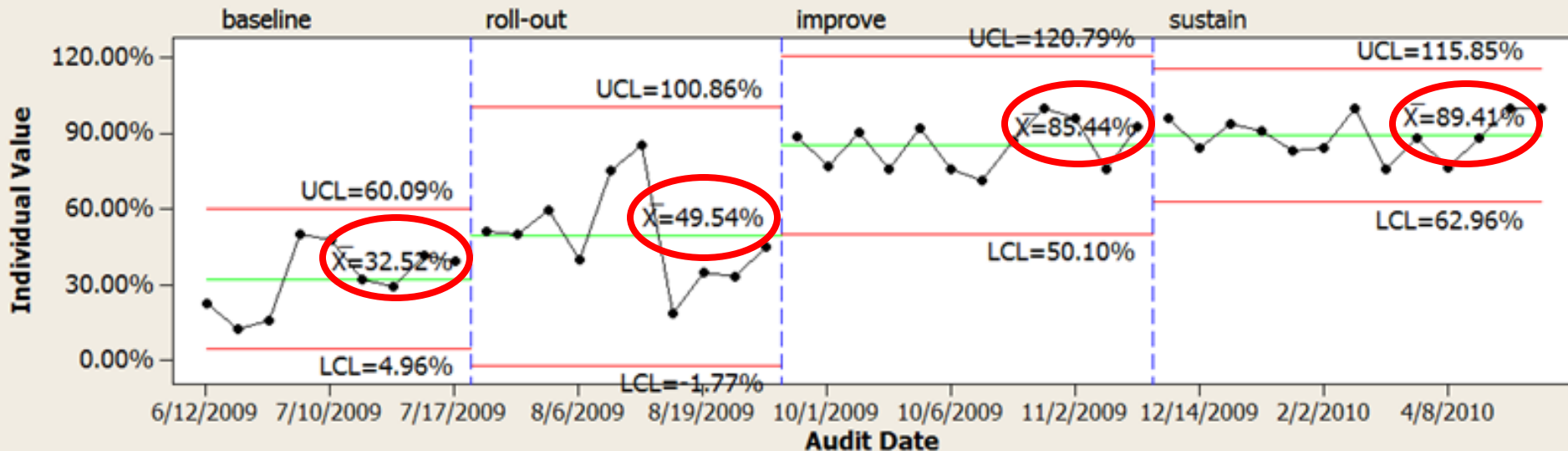
Audit Route Map



Approach (cont.)

- Audit results will be communicated to lab occupants and their managers
- A quarterly pizza party for any division in each building that has a closure rate of 95% or higher will be the incentive.

Results From Two Pilot Building



Long Term Benefits of “Sash-to-Save”

- Almost \$1 million in savings a year if hoods are closed on nights and weekends.

Immediate Benefits

- When surveying, I would close every fume hood that was open.
- This has energy saving potential
- After a month, I preformed a spot check on a set of OPEN and “Rarely” or “Never” used fume hoods.
- This set consisted of 138 hoods.

Spot Check Results

Use Status	% Closed
Never	100.00%
Rare	69.42%
Total	73.19%

Immediate Benefits

- Assumptions
 - \$4 per cubic feet per minute (CFM) per year
 - Closing a fume hood decrease flow by 40%
 - To be conservative taking 50% of that total
- Low end savings = \$65,000/year
- High end savings = \$175,000/year

Personal Benefits

- Learned simple ways in which a company can save energy and money
- Learned new problem solving techniques
- Had the opportunity to work for a great company that has provided me with a very valuable learning experience