Developing a Staff Culture of Sustainability

Thursday, July 11\textsuperscript{th}

11:00-12:30pm
Why do you need a Ventilation Coordinator?

Monica Witt
Sustainability Program Manager
7/11/2019
Agenda (list of questions… that I hope to answer)

- Where, What is Los Alamos National Laboratory?
- What is Smart Labs? Why Smart Labs? Why at LANL?
- How quickly did we realize we needed a Ventilation Coordinator?
- What does a Ventilation Coordinator do?
- How did we convince everyone to trust and depend on the Coordinator?
The role of Los Alamos for the nation

Office of Science Laboratories

1. Ames Laboratory
   Ames, Iowa

2. Argonne National Laboratory
   Argonne, Illinois

3. Brookhaven National Laboratory
   Upton, New York

4. Fermi National Accelerator Laboratory
   Batavia, Illinois

5. Lawrence Berkeley National Laboratory
   Berkeley, California

6. Oak Ridge National Laboratory
   Oak Ridge, Tennessee

7. Pacific Northwest National Laboratory
   Richland, Washington

8. Princeton Plasma Physics Laboratory
   Princeton, New Jersey

9. SLAC National Accelerator Laboratory
   Menlo Park, California

10. Thomas Jefferson National Accelerator Facility
    Newport News, Virginia

Other DOE Laboratories

1. Idaho National Laboratory
   Idaho Falls, Idaho

2. National Energy Technology Laboratory
   Morgantown, West Virginia

3. Savannah River National Laboratory
   Aiken, South Carolina

4. National Renewable Energy Laboratory
   Golden, Colorado

NNSA Laboratories

1. Lawrence Livermore National Laboratory
   Livermore, California

2. Los Alamos National Laboratory
   Los Alamos, New Mexico

3. Sandia National Laboratory
   Albuquerque, New Mexico

Nuclear Security Enterprise

1. Kansas City Plant
2. Lawrence Livermore National Laboratory
3. Los Alamos National Laboratory
4. Nevada National Security Site
5. Pantex Plant
6. Sandia National Laboratories
7. Savannah River Site
8. Y-12 National Security Complex
LANL Infrastructure Statistics

- ~40 square miles
  - 7,500 ft. elevation
  - 13 nuclear facilities
- 920 owned buildings with 8.2M gross sq. ft. (owned)
  - 50% more than 40 years old
  - 295 occupied buildings
  - 0.43M gross sq. ft. of leased properties
  - 0.35M gross sq. ft. shutdown assets

- Roads
  - 22 miles of primary roads
  - 62 miles of secondary roads

- Utilities
  - 32 miles of primary power lines
  - 166 miles of secondary power lines
  - 57 miles of gas distribution lines
  - 109 miles of water distribution lines (fire and potable)
  - 28 miles of steam lines
  - 63 miles wastewater

Land comparison of Washington, D.C. and the Los Alamos National Laboratory Site
The Laboratory is an integrated and dynamic system of people, facilities, equipment, materials and services that supports our national security mission.

- **Weapons Programs**
  - Weapons Physics Design
  - Weapons Physics Computation
  - Weapons Engineering
  - High Explosives
  - Plutonium
  - Tritium/EIS
  - Uranium, Be, Salts, Metals
  - Detonators
  - Component Fabrication and Assembly
  - Integrated and Environmental Testing

- **Science, Technology and Engineering**
  - Chemistry, Earth and Life Sciences
  - Accelerator Science
  - Engineering Sciences
  - Materials and Physical Sciences
  - Theoretical and Computational Sciences

- **Director’s Office**
  - Institutional Management

- **Global Security**
  - Nuclear Nonproliferation
  - Nuclear Counter-proliferation
  - Non-nuclear Threats
  - Energy and Resource Security

- **Waste Management**
  - Enduring Waste
  - Legacy Waste

- **Institutional Operations**
  - Business Services
  - ES&H
  - Nuclear & High Hazards Ops
  - Security and Mission Assurance

- **Capital Projects**
  - Project Management Services

- **Site Information**
  - 40 square miles
  - 47 technical areas
  - 1,280 buildings/9M sq. ft.
  - 11 nuclear facilities
  - 268 miles of roads
  - 8,000 career employees
  - 2,250 R&D scientists and engineers
  - 350 postdocs
  - 1,600 students at peak
  - $2.5B budget
  - 60% Weapons Program
  - 4,700 projects
  - 600 B&R codes
  - 5 PADS
  - 14 Directorates
  - 80 Divisions
Los Alamos is essential to ensuring the U.S. nuclear deterrent – we are responsible for four of the seven weapons systems in the nation’s arsenal

- Los Alamos helps ensure the safety, security, and effectiveness of the nation’s deterrent
- Los Alamos is the design agency for four of seven weapons systems in the nation’s arsenal

Non-nuclear testing, modeling, simulation, and other tools and capabilities provide assurance

We use science to annually certify to the Secretary of Energy, Secretary of Defense, and the President that the stockpile will perform as intended.
What is a “Smart Lab”?

“Smart Labs” are newly constructed or retrofitted laboratories that improve safety protocols, reduce building energy consumption, and effectively monitor and continuously commission the building improving operational control and mission responsiveness.

1. Fundamental platform of dynamic, digital control systems
2. Demand-based ventilation
3. Low power density, demand based lighting
4. Exhaust fan discharge velocity optimization
5. Pressure drop optimization
6. Fume hood flow optimization
7. Commissioning with automated cross platform fault detection

Smart Labs should be:
- Effective
- Safe
- Efficient
- Sustainable
UC Irvine set the example

Important Lessons Learned

- Core team approach is key
- Still works after 14 years
- Improved safety, fewer incidents
- Reduced energy use by over 50% on average
- Both new construction and existing buildings
- Tenant involvement is key from very beginning
Minimizing the potential for degradation and failure is the key to minimizing the risk of airborne hazards in labs

Good maintenance = Improved rigor and efficiency
Smart Labs have constructible parts:
- LED lighting w/ controls
- VAV/DDC HVAC
- Information layer
- Demand Ventilation Systems

A Smart Lab Program:
- Puts in place processes and procedures
- Manages change
- Documents the expectations and results
Smart Labs Core Team & Ventilation Coordinator
But in the Ventilation World, we care about **FUME HOODS**!

Fume Hood Distribution at LANL

- 64% of Hoods are in the Science and Technology Operations (STO) Facilities

STO Fume Hood Distribution

- 44% Experimental Physical Science
- 50% Chemistry, Life and Earth Science
Current Status – Unstable & High Risk Conditions

Table 1 Description of Risk Control Bands

<table>
<thead>
<tr>
<th>Band</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Negligible</td>
</tr>
<tr>
<td>1</td>
<td>Low</td>
</tr>
<tr>
<td>2</td>
<td>Moderate</td>
</tr>
<tr>
<td>3</td>
<td>High</td>
</tr>
<tr>
<td>4</td>
<td>Very High</td>
</tr>
<tr>
<td>5</td>
<td>Extreme</td>
</tr>
</tbody>
</table>
Laboratory Ventilation Management Needs

• **We Needed Training:** with ESH, Maintenance, Cx and BAS to understand how the Demand for Ventilation Analysis is conducted and how to develop a Building Management Plan (BMP)

• **We Needed New Programs and More Efficient Processes:**
  • Fume Hood Preventative Maintenance Plan
  • A Dedicated Hood Maintenance Team
  • Hibernation Protocol for Ventilation Systems
  • Streamline Fume Hood Certification Process & Connection to Program Needs
  • Exhaust Fan and Fume Hood Database in our Material and Equipment List
  • CEREBRO

• **We Need Continuous Monitoring:** with Building Automation System, meters and lots of…

• **COMMUNICATION:** between team members and laboratory tenants
  (cliché → but the most important part of the entire process)
Future Projects

- Complete Fume Hood Preventative Maintenance Pilot
- Risk Control Banding Pilot
- Hibernation Protocol Pilot
- CEREBRO Pilot
- My Green Lab
- Benchmark Progress
Questions?

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Sarah Edwards
Cook County, IL
Monitoring Good Behavior: Cook County Employees Save Energy at Work

Sarah Edwards
Department of Environment and Sustainability
Cook County
Better Buildings Summit: July 11, 2019
Cook County

- Home to 5.2 million people, 2.44 million in suburban Cook (beyond the city of Chicago)
- 22,000 Cook County employees
- 171 County Owned Buildings
- 230,600,000 kWh used in 2018
Current Goals

- Creating a 100% renewable energy plan for electricity use in County buildings
- Resolution to be Carbon Neutral by 2050
- Behavior change work: create an awareness among employees of the importance of energy savings for the County
  - 2% energy reduction would be $382,000/year in avoided utility expenses
Previous Behavior Change Work with Cook County Employees

- Occurring in 2015-16, “Green Champion” program sponsored through an ESCO where employees would volunteer to be a sustainability advocate in their department through a one-time training and distribution of sustainability materials.
  - Covered reduced lighting, plug load, and waste.
  - Estimated Savings was a 2% reduction in total building electricity consumption for sites with Behavior Change programming.
Previous Behavior Change Work with Cook County Employees

Survey and Focus Groups conducted by a third party:
- About 490 County employees participated in the web based survey.

Green Champion Trainings:
- At 6 trainings across 4 focal sites: about 17 employees attended.

Internal implementation of savings measures under Green Champion Guidance:
- Measures were recycling, turning off the lights, and unplugging appliances.

Benefits:
- Comprehensive survey to understand gaps in sustainability knowledge and areas to target.
- Helpful lighting and plug load visuals/demonstrations.

Challenges:
- Difficult communication channels
- Not enough repetition
- Challenge incentivizing participation in a voluntary program.
Energy Efficiency Behavior Change Pilot

- Chose to focus on County buildings that have yet to receive significant energy efficiency upgrades, or have high energy usage
- Chose two courthouses as our pilot locations
  - They both were scheduled to receive larger energy efficiency upgrades, and this pilot aimed to dovetail behavior change work with these larger visible upgrades.
Pilot Site: Domestic Violence Courthouse

- Located at 555 W. Harrison St., Chicago
- A 4-story courthouse built in 2005
- 187,268 sq ft with occupied hours from 7am-6pm, M-F
- LEED certified in 2005 but hadn’t been upgraded since 2005
Pilot site: Maywood Courthouse

- Located at 1500 Maybrook Dr., Maywood, IL
- Built in 1973
- 184,841 sq ft with public operating hours from 8:30am-4:30pm, M-F
- Has had minimal upgrades since the 1970s
Turn Off Your Monitor Campaign

Outreach process before each evening audit:
- Emails to department heads, distributed stickers
- Left “Superstar” note and reward for compliance

Audit 1

Audit 2
- Emails to department heads with previous results, posters
- Left “Superstar” notes with reward for compliance, “oops” note where monitor still on

Audit 3
- Emails to department heads with results and pizza party announcement, posters
- Left “Superstar” notes with reward for compliance, “oops” note where monitor still on

Item(s) distributed during evening audit
Campaign Materials

Remember:
Please turn off your computer monitor when you leave work for the day. This helps to conserve energy at work.

When it’s time to go home, make sure there is no longer a yellow or white light blinking at you.

Reminder Posters in Hallways

Monitor Reminder Sticker
Campaign Materials

Way to be an energy-saving super star!

Thank you for turning off your computer monitor at the end of the day.

You can save energy and money at home too with free smart meter and energy efficiency programs. Learn more here: www.cookcountyil.gov/service/energy-efficiency

Oops Reminder Note: Started during the 2nd evening audit

It looks like you left on your computer monitor overnight.

Turning off your monitor at night helps conserve energy. When it’s time to go home, make sure there is no longer a yellow or white light blinking at you.

Positive Reward Note: Provided at every audit

Please Turn Off Your Monitor When You Leave
Results from Campaign: DVC

DVC Percentage of Monitors Turned Off by Audit

Audit 1  Audit 2  Audit 3
Result from Campaign: DVC

DVC Percentage of Monitors Turned Off During Audit 3

<table>
<thead>
<tr>
<th>Service</th>
<th>0%</th>
<th>20%</th>
<th>40%</th>
<th>60%</th>
<th>80%</th>
<th>100%</th>
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<tr>
<td>DV Legal Clinic</td>
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<td></td>
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<tr>
<td>Court Reporters</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>100%</td>
</tr>
<tr>
<td>Social Services</td>
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<tr>
<td>Children's Waiting Room</td>
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<td>71%</td>
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<tr>
<td>Family Rescue/ Metropolitan Family Services</td>
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<td>67%</td>
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<tr>
<td>Adult Probation</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>65%</td>
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<tr>
<td>Other Private Tenants*</td>
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<td>33%</td>
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<tr>
<td>Public Defender</td>
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<td>59%</td>
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<tr>
<td>OCJ/Judiciary</td>
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<td></td>
<td></td>
<td></td>
<td>36%</td>
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<tr>
<td>Office of State's Attorney</td>
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<td></td>
<td></td>
<td></td>
<td>36%</td>
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<tr>
<td>Clerk of Circuit Court</td>
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<td>17%</td>
</tr>
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</table>

Small Offices: Under 25 Monitors
Mid-Sized Offices: Between 25-65 Monitors
Large Offices: 65+ Monitors
Monitor will not turn off

Pizza Party
January 4/2019 at noon for all SSD staff at DVC
Sponsored by
Cook County Department of Environment and Sustainability
We are receiving recognition for our successful efforts in the Fall 2018 Cook County Energy Efficiency Program when we were all encouraged to help save energy and costs by simply turning off our computer monitors!
Results from Campaign: Maywood

Maywood Courthouse Percentage of Monitors Turned Off by Audit

- Audit 1
- Audit 2
- Audit 3
# Results from Campaign: Maywood

## Maywood Percentage of Monitors Turned Off During Audit 3

<table>
<thead>
<tr>
<th>Service</th>
<th>Percentage Turned Off</th>
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<tbody>
<tr>
<td>Court Reporters</td>
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<tr>
<td>Clerk of the Circuit Court</td>
<td>94%</td>
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<td>Public Defender</td>
<td>65%</td>
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<tr>
<td>Environment &amp;...</td>
<td>63%</td>
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<tr>
<td>OCI/Judiciary</td>
<td>36%</td>
</tr>
<tr>
<td>Sheriff Court Services</td>
<td>33%</td>
</tr>
<tr>
<td>Court Interpreters</td>
<td>33%</td>
</tr>
<tr>
<td>Juvenile Probation</td>
<td>31%</td>
</tr>
<tr>
<td>Social Services Department</td>
<td>28%</td>
</tr>
<tr>
<td>State’s Attorney</td>
<td>25%</td>
</tr>
<tr>
<td>Adult Probation</td>
<td>24%</td>
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</tbody>
</table>
Lessons Learned

- Larger reward was a better motivator
- Department head buy-in is a huge indicator of success
- Communication is... complicated
Lessons Learned (continued)

- Oops notes were surprising helpful
- Monitor reminder sticker didn’t correlate to turning off the monitor
Next Steps

- Utilize the County Green Buildings Program to develop future campaigns across the Cook County building portfolio for monitors and other energy plug load campaigns, provide lessons learned, etc.
  - We started at 118 N. Clark St, the main County building with 1100 employees. If 50% success rate again, this could save an estimated 76,986 kWh.

- Develop new or communicate existing power management policies with elected officials
- Integrate the use of Smart power strips in employee spaces and break rooms with funding from Green Buildings Fund
- Adopt a policy/procedure for personal printer usage to reduce plug load impacts
Questions?

- Sarah Edwards, Cook County
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  312-603-3459
Developing a Staff Culture of Sustainability

July 11, 2019

2019 Better Buildings Summit
Jonathan Bauer, Sustainability Manager
Company Overview

THE TOWER COMPANIES AT A GLANCE

- 6 MILLION square foot portfolio (Tower and partner-operated)
- 13 MILLION square feet in development
- 100 employees
- 90% of portfolio operating under a green lease
- 100% renewable energy commitment
- 2,000 employee volunteering hours used since 2012
- 15% of staff have been with the company for 20 years or more
- 42% of our Senior Leadership team are women
- 95% LEED Certified
- 80% of Office Building Portfolio is ENERGY STAR Certified
- Two dedicated sustainability team members, including senior leadership position

PEOPLE. PROPERTIES. PURPOSE.

At The Tower Companies, we are committed to making a difference through our business and community. We develop, own, and manage commercial, retail, and multifamily residential properties in the Washington D.C.-metro area while being mindful of our global impact. Our dedication to the nation’s capital has allowed us to build long-term relationships and foster lasting community impact.

Since our founding in 1947, we have continued to thrive while staying true to the belief that our actions and business can positively benefit the health of our people and planet.

OUR VISION

We envision a world where buildings inspire and enrich the lives of their occupants. In this world, people seek out buildings that create positive social change by helping to sustain the environment, better their health and well-being, and connect them to thriving communities.
DC Based Portfolio
Our Commitment

At every decision point, we consider our ability to advance the real estate industry, impact on the environment, and commitment to the well-being of people and local communities.
Sustainability Touches Everyone

1. Ownership
2. HR
3. Legal
4. Tenant Leasing & Construction
5. Property Management
6. Engineering & Maintenance
7. Accounting/Tax
8. IT
How has Tower built a sustainability culture?

1. Energy & Water Efficiency
2. Green Leasing
3. Waste Management Program & Training
4. Environmental Holidays & Events
5. Wellness Program
6. Community Service
Energy & Water Efficiency

- Benchmarking & Goal Setting
- Green Building Standards
- Green Lease Requirements
- Preventative Maintenance
- Energy and Water Conservation Measures
- Work Tickets for Client Issues
- Real-Time Energy and Water Monitoring
- Tenant Engagement
- Energy Procurement
- Demand Response
- Renewable Energy
Green Leasing

Green Lease Categories

• Water Efficiency
• Energy Efficiency
• Materials & Resources
• Indoor Environmental Quality

Types of Requirements

• Design
• Construction
• Operational
Waste Management Program & Training

- Mixed Paper
- Commingled Recycling
- Compost
- Electronic Recycling
- Large Cardboard
- Landfill
Tayst - Zero Waste Coffee & Tea Operation

100% COMPOSTABLE KEURIG COMPATIBLE POD

- **THE LID**
  - A combination of paper & other compostable materials with new compostable inks

- **THE RING**
  - Made from a blend of biorecycled paper from renewable sources & coffee chaff

- **THE MESH**
  - Innovative bio-based substance that composts. The mesh allows brew to flow evenly through coffee for smoother taste

- **THE COFFEE**
  - Superior beans are roasted fresh and cooled slowly, then portioned into our pods for a consistent flavor
Environmental Holidays & Events

Sustainability Snapshot

61 MILLION kWh OF ELECTRICITY CONSERVED

92 MILLION GALLONS OF WATER SAVED

Reduced greenhouse gas emissions equivalent to carbon sequestered by 88,000 ACRES OF U.S. FORESTS IN ONE YEAR

187,000 POUNDS COMPOSTED

58% OF WASTE DIVERTED FROM LANDFILLS

Please Join us to Celebrate
America Recycles Day!
November 15, 2018

2000 Tower Oaks Program Reminders

- Composting: Composting is available throughout the building. It includes office paper, some food waste, and leaves. The compost is used for landscaping.
- Cardboard Recycling: Cardboard recycling is located at the U.S. Post Office on the main level of the building. Please use this service to recycle cardboard products.
- Batteries Recycling: Batteries can be recycled through the recycling program. Please ask your Building Manager for details.
- E-waste Recycling: E-waste includes electronic devices such as computers, printers, and televisions. It can be recycled through the e-waste program. Please ask your Building Manager for details.
- Landfill Waste: Landfill waste includes items that cannot be recycled or composted. It is collected in the building and transported to the landfill. Please do not throw items in the trash unless they are specified as landfill waste.

Did you know?
- The average person produces ~7 pounds of waste each day equivalent to more than 3 tons per year.
- Tip: Reduce your waste by using reusable materials and recycling.
Tower Tree Program

- CDC Scorecard
- Virgin Pulse Program
- Transcendental Meditation
- Infinity Wellness
- Fitwel

My team scored **2,448,155** total steps. That's like walking the Great Himalayan Trail!

<table>
<thead>
<tr>
<th></th>
<th>Team Steps</th>
<th>Total Team Steps</th>
<th>Total Team Miles</th>
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<td><strong>163,210</strong></td>
<td></td>
<td><strong>2,448,155</strong></td>
<td><strong>1,224</strong></td>
</tr>
</tbody>
</table>
Tower’s Community Service Program

- All employees receive 8 hours per year for community service, which must be used during work hours
- 80% participation in 2018
- Events often focus on environmental issues
Recommendations

• Find internal champions
• Patience…it won’t happen overnight
• Be realistic…if everyone cared about sustainability we wouldn’t be talking right now. Don’t put too much effort into changing everyone.
• Bring high energy and have fun!
Developing a Staff Culture of Sustainability

Jonathan Bauer, Sustainability Manager

Jonathan.Bauer@TowerCompanies.com

Read Tower’s Inaugural Corporate Responsibility Report to Learn More:
https://towercompanies.com/corporate-responsibility/
Thank You

Provide feedback on this session in the Summit App!

Download the app to your mobile device or go to event.crowdcompass.com/bbsummit19