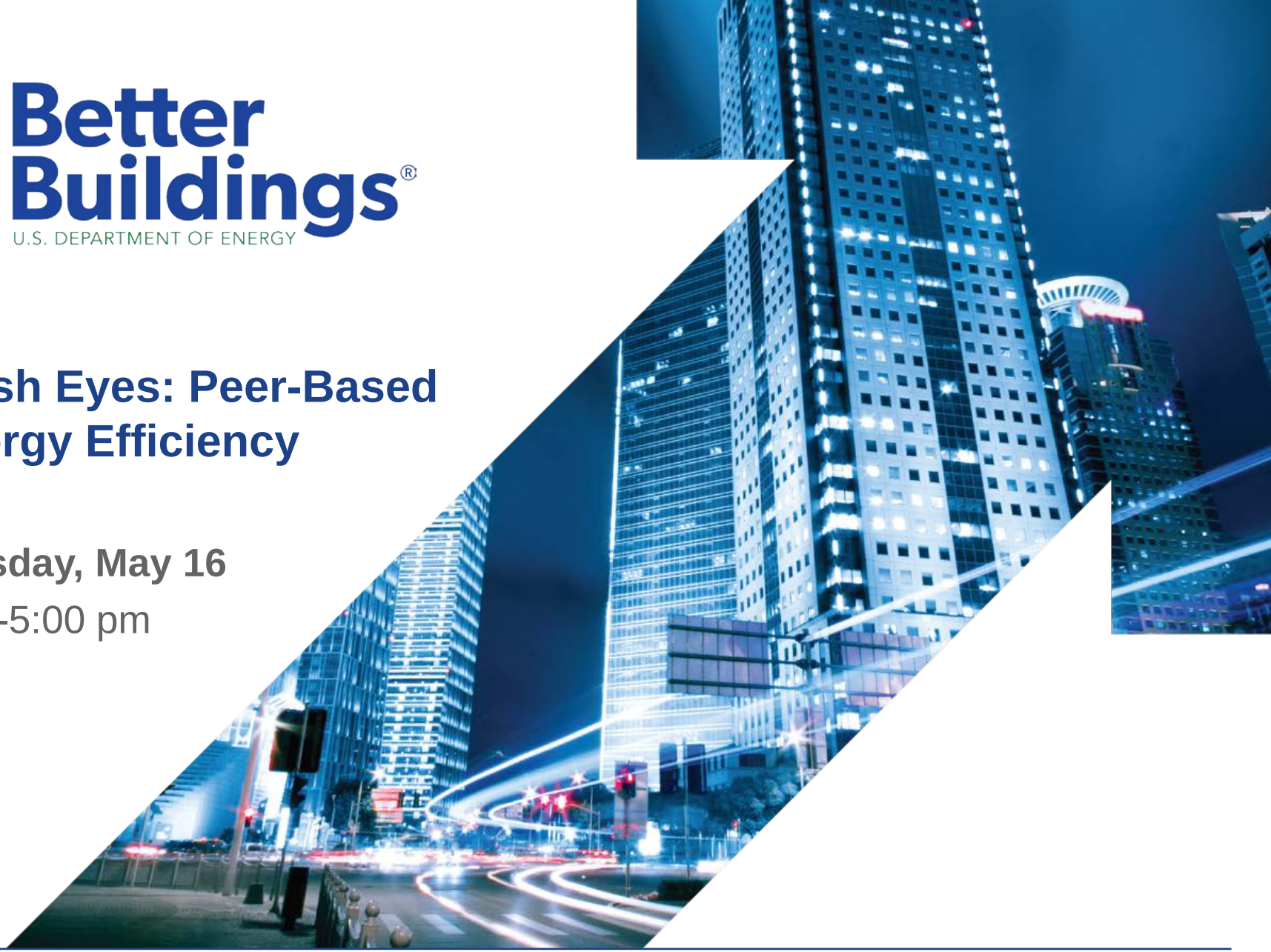
Better Buildings®
U.S. DEPARTMENT OF ENERGY



Fresh Eyes: Peer-Based Energy Efficiency

Tuesday, May 16

3:45-5:00 pm

U.S. DEPARTMENT OF ENERGY

Panelists

- Brett Rasmussen, Nissan, and Kevin Bell, Toyota
- Uli Schildt, Darigold
- Karen Flack, U.S. Naval Academy
- Eli Levine, U.S. Department of Energy (Moderator)

Brett Rasmussen, Nissan
Kevin Bell, Toyota

U.S. DEPARTMENT OF ENERGY

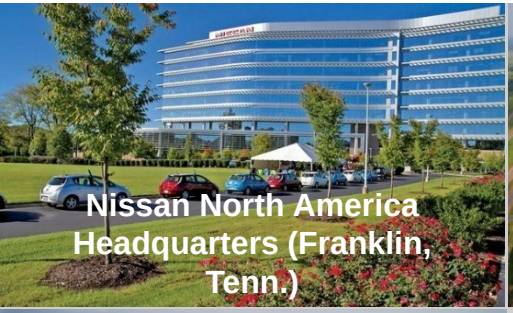
Better Plants
U.S. DEPARTMENT OF ENERGY

Fresh Eyes: Peer-Assessed Energy Efficiency by Brett Rasmussen

May 16 2017

U.S. DEPARTMENT OF ENERGY

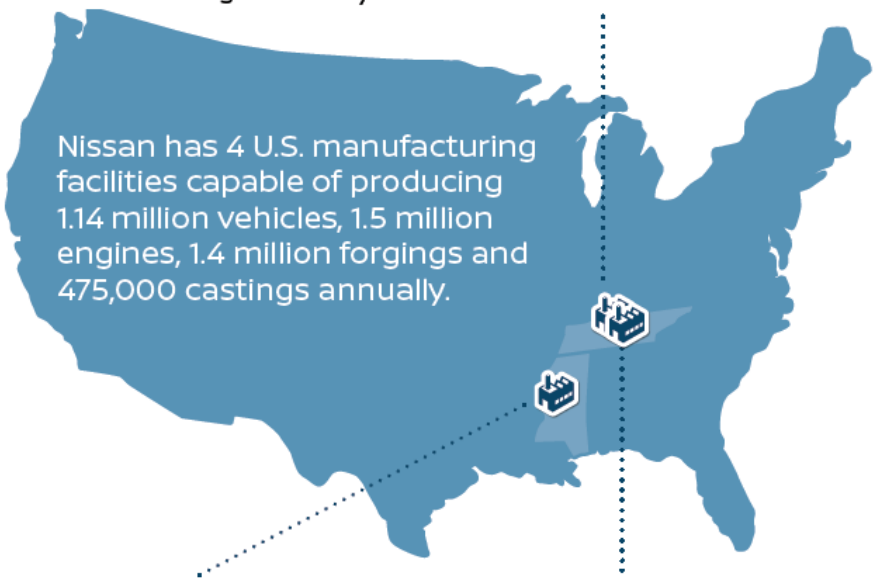
U.S. FOOTPRINT



More than **22,000** employees in the U.S.

U.S. MANUFACTURING & INVESTMENT

Nissan Smyrna Vehicle Assembly Plant and Battery Plant
Employees: 8,400 | Production: 642,000
Our vehicle production plant in Smyrna, Tenn. is the largest not only in the U.S. but in the Americas.



Nissan Canton Vehicle Assembly Plant
Employees: 6,400
Production: 450,000
Canton, Miss.

Nissan and Infiniti Decherd Powertrain Plant
Employees: 1,900
Production: 1.5 million engines
Decherd, Tenn.

More than **22,000 U.S. employees** including 16,000 manufacturing jobs

15 million vehicles proudly manufactured in the U.S. since 1983

10 million engines proudly manufactured in the U.S. since 1997

$14 billion spent with **300** suppliers in 30 states in U.S. in 2016

$11 billion investment in manufacturing in the U.S. since 1981

U.S. MANUFACTURING

MISSISSIPPI
CANTON VEHICLE ASSEMBLY PLANT

NISSAN GROUP OF NORTH AMERICA

TENNESSEE
SMYRNA VEHICLE ASSEMBLY PLANT

DOE Recognizes Canton for ISO 50001

Superior Energy Performance®
U.S. DEPARTMENT OF ENERGY

PLATINUM
2017-20

Canton Vehicle Plant

Nissan North America Inc.

Recognized by the U.S. Department of Energy for implementing ISO 50001 and Superior Energy Performance program standards, and improving energy performance by 20.9% over 3 years.

Nissan Hosts Energy Assessment Workshop at Canton Plant

TOYOTA

Calsonic Kansei

3M

ALCOA

ArcelorMittal

M-TEK, INC.

Yates Services

Schneider Electric

TOTAL PETROCHEMICALS

OAK RIDGE NATIONAL LABORATORY
Managed by UT-Battelle for the Department of Energy

FCS CONSULTING SERVICES, INC.

Joint Supplier Nissan Toyota Energy Treasure Hunt

TOYOTA

NISSAN

ENERGY STAR AWARD 2012

SUSTAINED EXCELLENCE

Bench Marking

Better Plants
U.S. DEPARTMENT OF ENERGY

Nissan Energy Treasure Hunt Exchange with Toyota

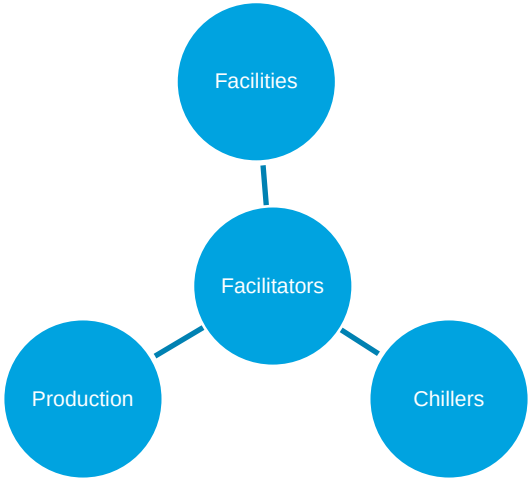
May 1 – 3 2016

U.S. DEPARTMENT OF ENERGY

Nissan Toyota Team Treasure Hunt at Decherd

Background Data

- An Energy Treasure Hunt Exchange is a 3-day event focused on identifying savings opportunities with a focus on **No Cost / Low Cost** implementation
- Each opportunity is quantified with a standard calculation using the plant's energy cost
- 3 teams were formed focusing on specific energy resources



Teams

Facilities

Nathan Payne – Team Leader

Ron Jones – TEMA
Kenley Allen – Nissan
Bruce Eakin – Nissan
Terry Neal – Nissan
Carlos Colon – Nissan
Merle Kilgore – Nissan
Dan Cooper - TEMA

Production

Richard Russel– Team Leader

Kevin Bell – TEMA
Eddy Kiggen – TMMAL
Claude Hale – Nissan
Mike Livingston - Nissan

Chillers

Randy Cook– Team Leader

Brett Rasmussen - Nissan
Daryl Cox – ORNL
Nick Barhorst – TEMA
John Bedford - Nissan

Facilities – All opportunities

Opportunities	Savings
CAPS Blow Off Valves	$ 7,063
Shutdown timer during non production	$ 8,965
Reduce Compressed Air Pressure	$ 75,842
Reduce Weekend Compressed Air Pressure	$ 16,686
Chemical Storage Building Overhead Lights	$ 1,481
CAPS Cooling Tower VFD	$ 9,244
Wastewater and Chillller Room Overhead Lights	$ 4,258

Total $123,500

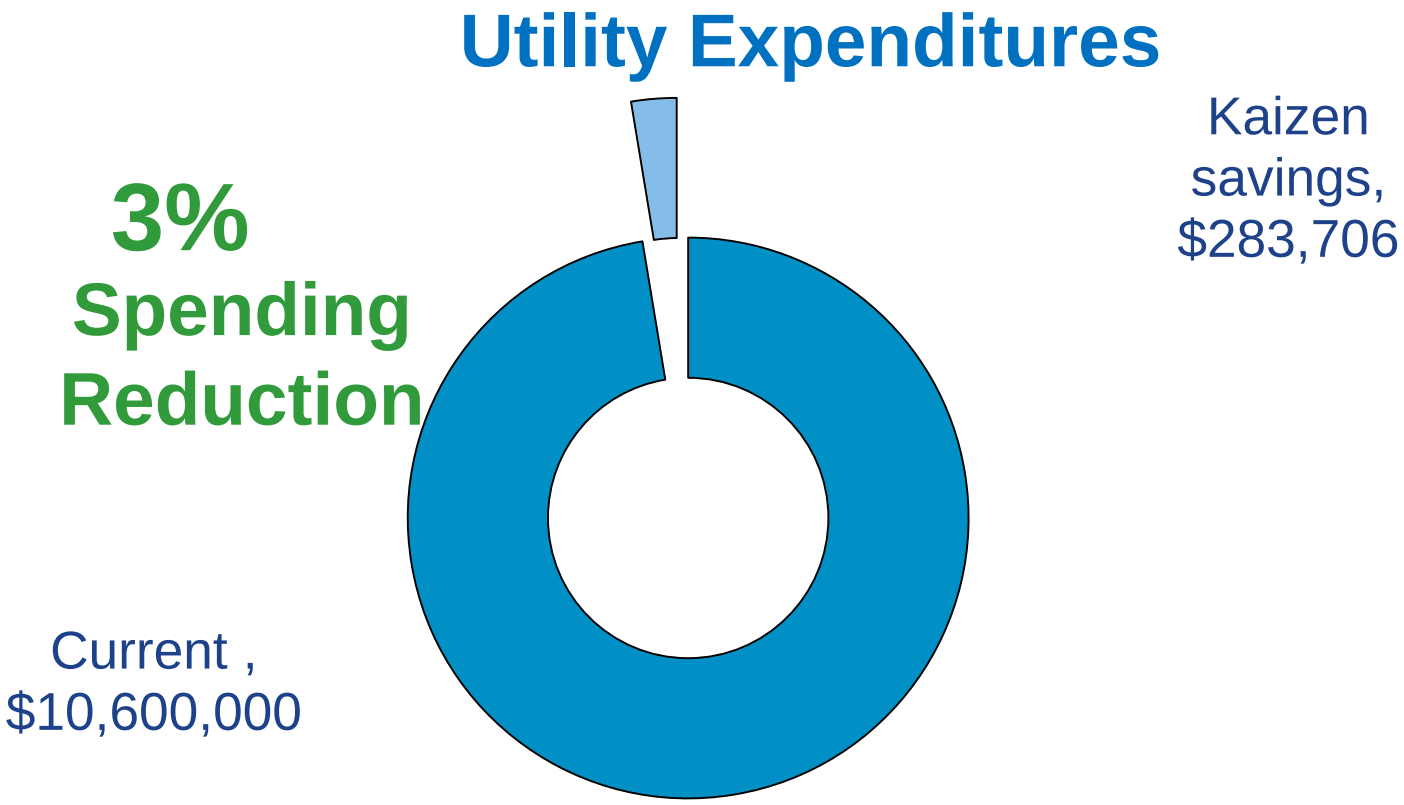
Production All Opportunities

Opportunities	Savings
Repair Air Leak	$ 7,932
Lighting	$ 1,502
Column F32 Flourescent light change to LED	$ 881
Turn Off Block Curing Heaters On Down Time	$ 3,456
E Motor Break Area	$ 386
E Motor Hi-Bay Lighting	$ 4,123
Eliminate 13 T8 Fixtures On the South Wall Of Machining Plant	$ 1300
FANS	$ 65
FANS	$ 2,324
Harvesting Daylight for A Aisle	$ 2,191
Plant Hi Bay Lighting Sodium	$ 3,821
Lighting	$ 237
	Total $28,300

All Opportunities Chillers

Opportunities	Savings
Condenser Cooling Pumps 200 HP VFD	$ 81,865
Air Compressor Cooling Tower	$ 27,288
Chiller Insulation	$ 6,046
Engine Test	$ 8,186
Induction heater Cold Water Pumps	$ 8,186
Shut down pump for Air Compressor	$ 4,466
	Total $ 136,000

Treasure Hunt Savings Identified



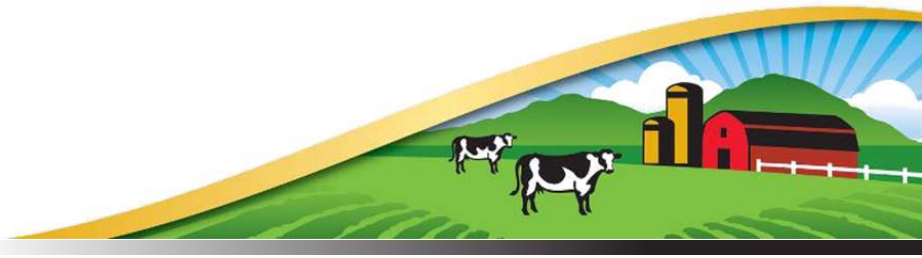
Questions / Comments

Thank You!

Uli Schildt

Darigold

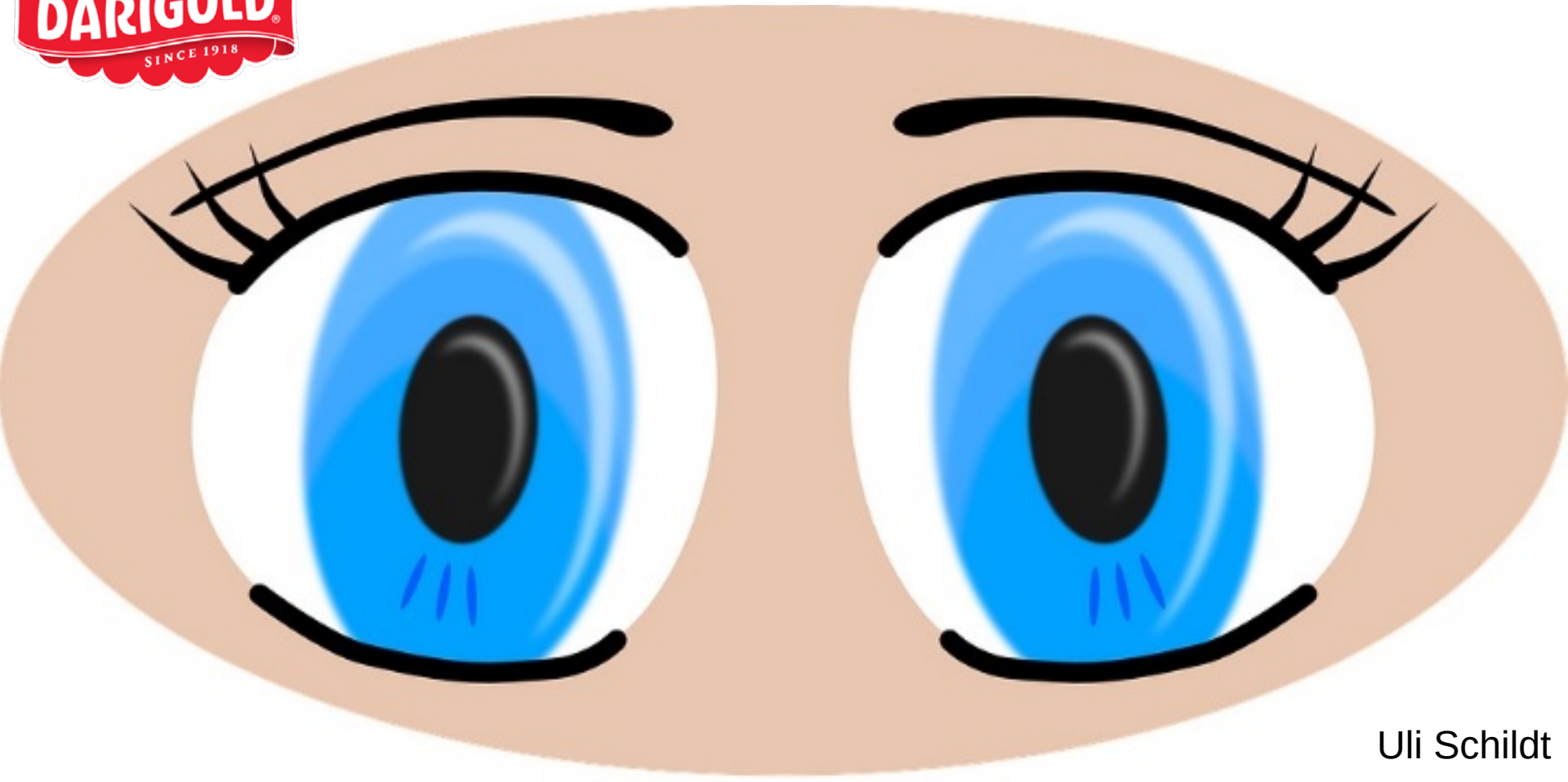
U.S. DEPARTMENT OF ENERGY



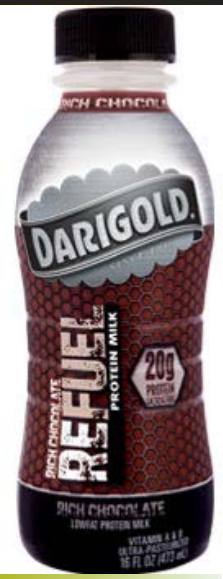
Better Buildings Summit – May 16, 2017

DARIGOLD SINCE 1918

Fresh Eyes

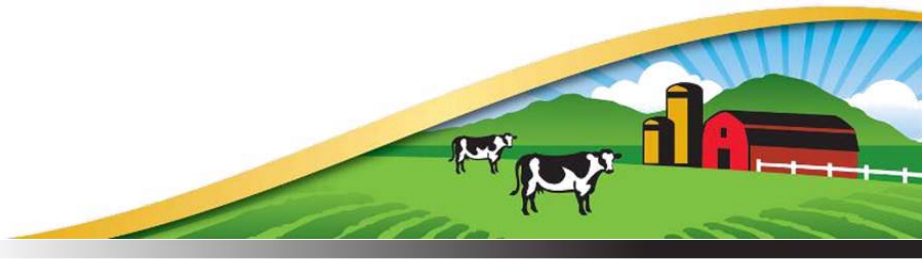


Uli Schildt



DARIGOLD

- 500 farmer owned co-op
- 2.5 million gallons of milk per day
- 11 manufacturing facilities WA, OR, ID & MT
- Consumer products and ingredients divisions
- 1400 employees
- $2 billion sales annually



Developing an Integrated Energy Management Program

Some of our Partners

Better Plants
U.S. DEPARTMENT OF ENERGY

IDFA

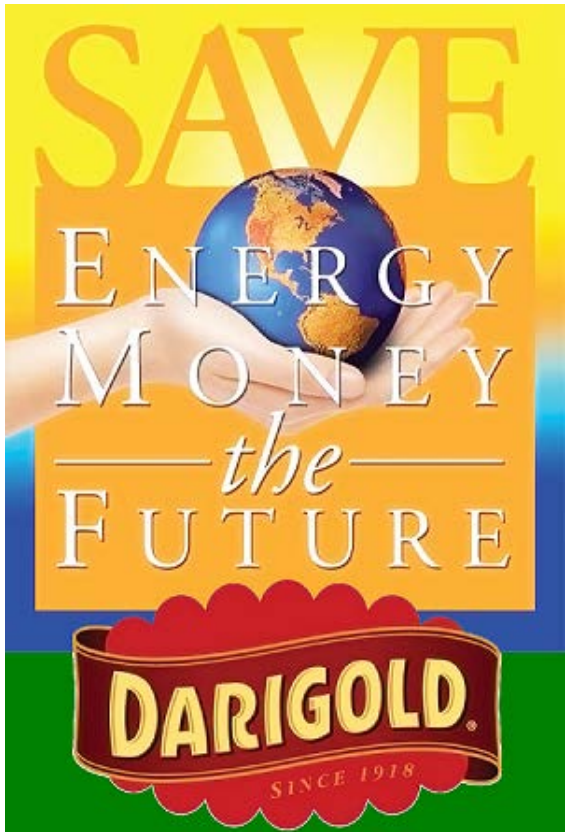
Boise State

OSU
Oregon State
UNIVERSITY

Washington State University
Extension Energy Program

EnergyTrust of Oregon

neea



ENERGY STAR PARTNER

NWFPA
NORTHWEST FOOD PROCESSORS ASSOCIATION

PSE PUGET SOUND ENERGY

Seattle City Light

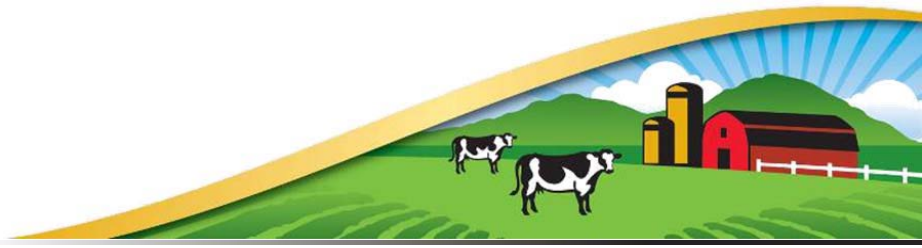
IDAHO POWER.
An IDACORP Company

Benton REA

AVISTA

PUD
PUBLIC UTILITY DISTRICT

Portland General Electric



Energy Treasure Hunt

DOE INPLT Training

- **Sunnyside, WA**
- **November 15 – 17, 2016**
- **18 plant participants (mostly from production floor)**
- **Representatives from other Darigold Locations (Spokane, Portland & Caldwell)**
- **Invited guests**
  JR Simplot Co., Shields Bag & Printing
- **System experts**
  - **Wayne Perry – Kaeser (Compressed Air)**
  - **Richard deFay – Copper Alliance (Electric Motors)**
  - **Nick Westerberg – Westerberg & Assoc. (Steam)**
- **Training was provided by each System Expert**

Four Teams

- Compressed Air
- Electric Motors
- Steam
- Water

Teams were established ahead of time and leaders designated.

A plant-walk with all participants started the event.

The group then split into their teams and proceeded with the Treasure Hunt.

Compressed Air Team Discusses Findings

Steam-System Training Session

Sunnyside Treasure Hunt Participants

Result:

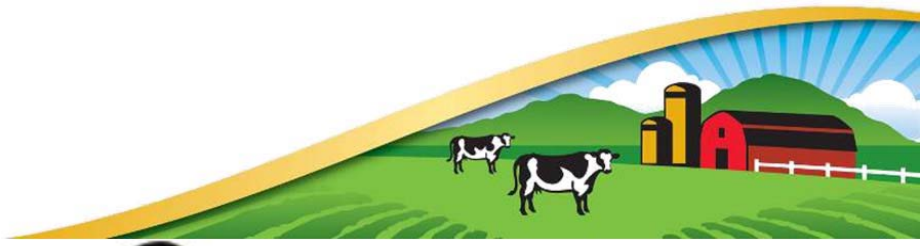
- **Each team identified numerous opportunities**
- **Several low cost / no cost items have already been implemented**
- **Created heightened awareness among plant employees**
- **Several participants joined the Plant Energy Team**
- **System Experts, employees from other Darigold locations and the invited guests provided Fresh Eyes and an unbiased view**

“I truly believe this Energy Treasure Hunt was enlightening. Not only for the plant but for everyone that attended.

I witnessed people change their ways of thinking and actually become excited to reduce energy usage. Employees also became very proud of their job and Darigold. Becoming aware of your surroundings and keeping an eye out for ways to save energy.

This program cultivates an energy-saving mindset and opens the door for discussions throughout the plant. …..”

One Treasure Hunt Participant’s Survey Response



Portland Dari-Gold-Dig

January 31, 2017

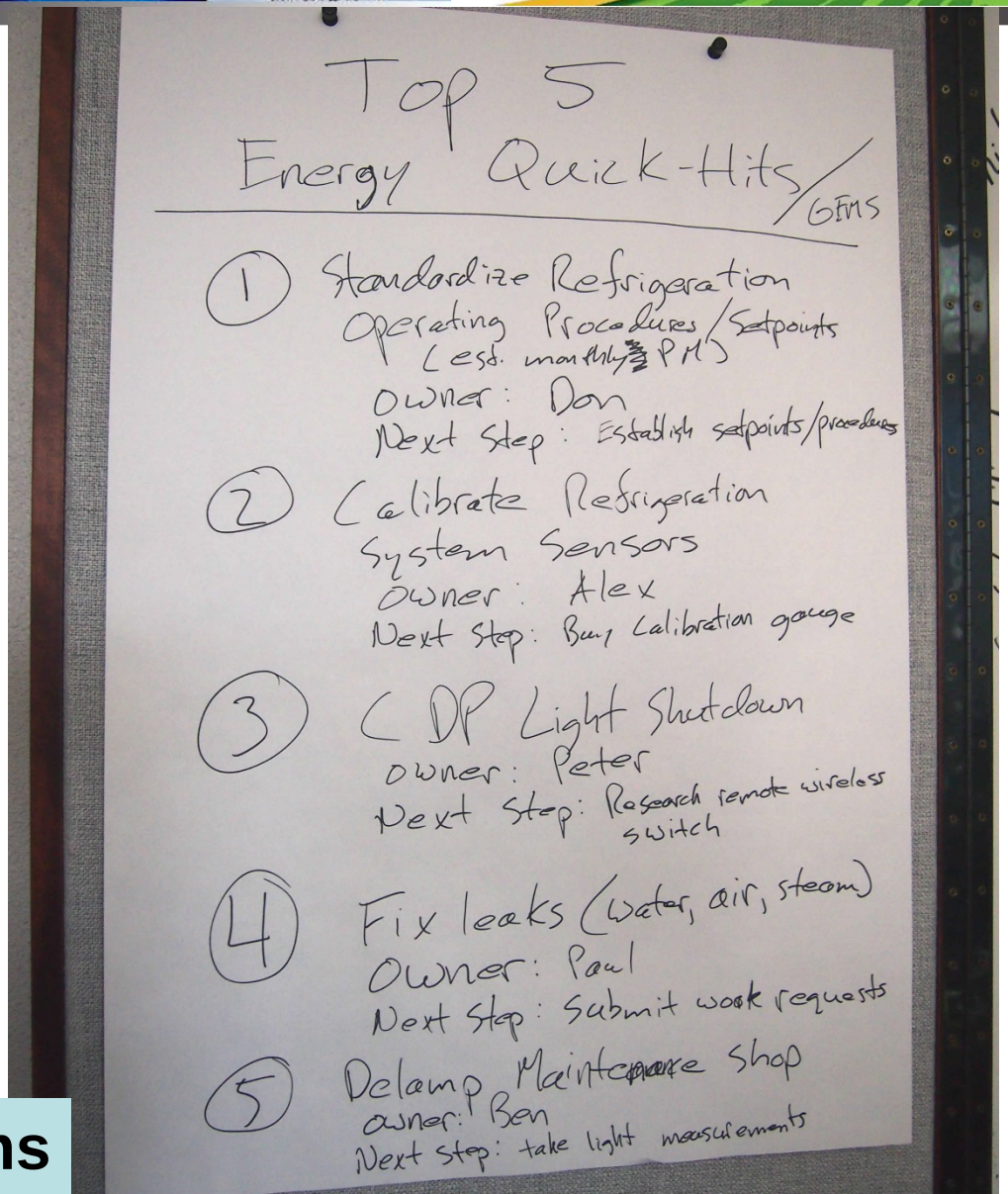
- One-Day event
- Energy Trust of Oregon
- 3 Teams
- Identified numerous opportunities in short time
- Sorted opportunities
- Created hit-list

"There is wasted energy in them thar plant"

Verifying Temperature Control Set-Points

Team Decides on Energy Savings Opportunity Finding Priorities

Sorting energy saving opportunities



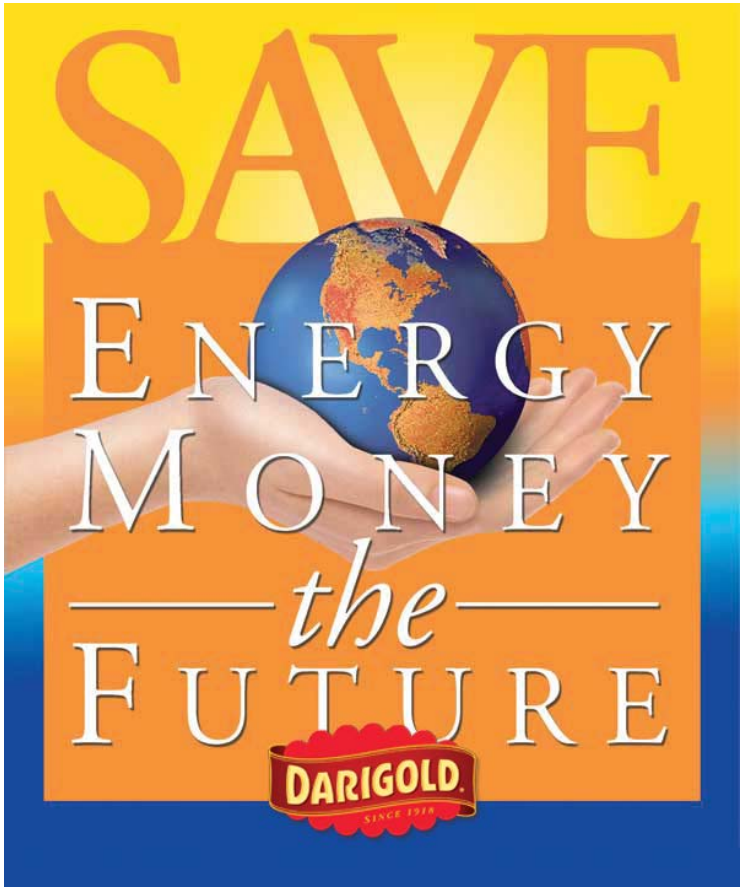
Hit-List of 5 Items

Main Takeaways:

- **Both, the 3-day Treasure Hunt and 1-day Dari-Gold-Dig seem to be effective**
- **Employee engagement was excellent at both events**
- **Even in plants with effective Energy Teams, the events created additional focus and revealed new opportunities**

Energy $avings are small,.... message is HUGE!

Saving Energy Is Everybody's Responsibility



Thank You

uli.schildt@darigold.com (206) 795-3731

Karen Flack

U.S. Naval Academy

U.S. DEPARTMENT OF ENERGY

USNA – USAFA Better Building Challenge
Same Mission…Different Campus

Karen A. Flack
Department of Mechanical Engineering
United States Naval Academy

Fresh Eyes: Peer-Assessed Energy Efficiency
Better Buildings Summit
18 May 2017 Washington, DC

Sister Institutions

- Similarities
  - Mission
  - Funding structure
  - Historic building status
- Differences
  - Environmental climate
  - Age of buildings
  - Uniforms
- Healthy competition

Engage Leadership

Miranda A Ballentine

Assistant Secretary of the Air Force, Installations and Energy

Dennis V. McGinn

Assistant Secretary of the Navy, Installations and Energy

LTGEN Michelle D. Johnson

Superintendent, United States Air Force Academy

VADM W. Ted Carter

Superintendent, United States Naval Academy

Feeding 4000 in 30 minutes…

USAFA Mitcher Hall

USNA King Hall

Can be wasteful

Transportation, refrigeration, preparation and disposal of extra food is very energy intensive

USAFA
Excessive packaging
Plastics recycled
Food waste trucked to pig farm

USNA
Salad bar and dessert bar to limit waste
Limited recycling
Food waste sent to biodigestor

Progress

<u>Prototype Biodigestor Funded</u>
Each module has one weeks worth of food waste
3000 lbs of food waste per day
Process takes 3-5 weeks
60Mw-hrs/month (estimated)
$7000 savings per month
High quality compost as bi-product

It’s sunny in Colorado Springs

<u>USAFA Rooftop Solar</u>
Lightweight
Flexible
Inexpensive
Not visible at ground level

Additional ground based array (6 MW)

Progress at USNA

<u>USNA Solar Plans</u>

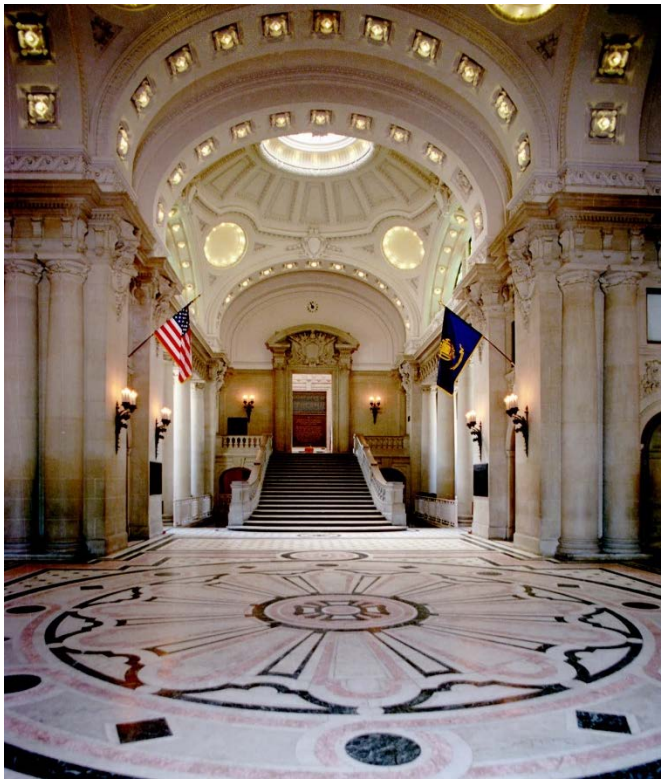
PV rooftop array at boat repair facility

Solar thermal at laundry facility

More in planning stages

Re-lamping can have big dividends

Progress at USNA



<u>USNA lighting projects</u>
Historic buildings
Indoor athletic facilities
Outdoor athletic facilities
~ 4 year payback
9 additional facilities scheduled

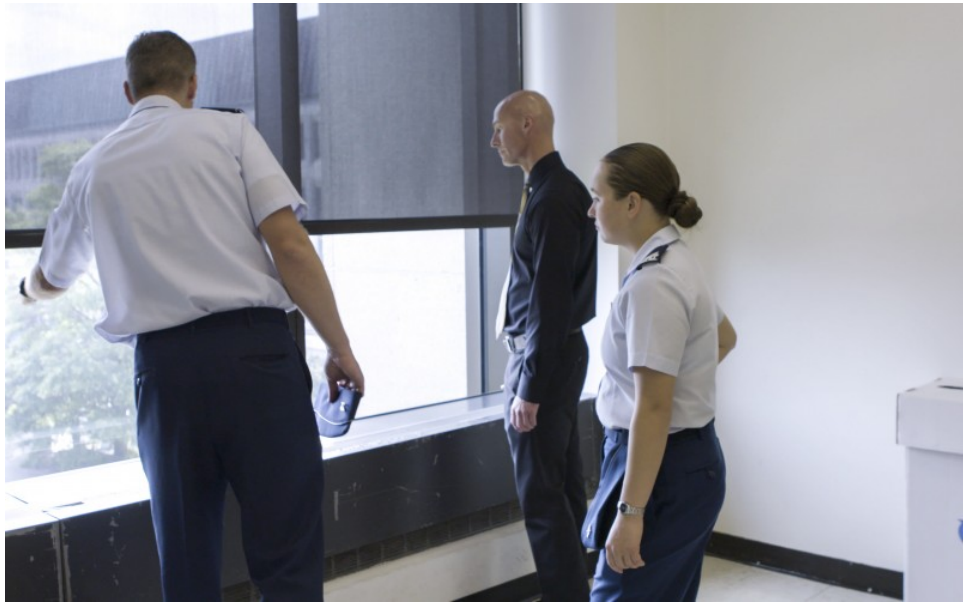
Big Academic Buildings

<u>USAFA Fairchild Hall</u>
Home to all academic classes and laboratories

<u>Issues</u>
Single Pane Windows
Aluminum structure
Tremendous heat load
Too big to tackle as one project

Big Academic Buildings

<u>USNA Rickover Hall</u>
Home to four engineering majors and laboratories



<u>Issues</u>
Outdated HVAC
Mold
Condensation
Uneven use of window shades

Progress at USNA

USNA Rickover Hall
All windows replaced – one quadrant at a time
$60M HVAC renovation scheduled to start June 2018

Fresh Perspective

- Understanding core mission is important
- Behavior change matters
- It is easy to overlook the obvious
- Both sides benefit
- Healthy competition can influence decision makers
- Follow through required to assure systems and changes continue to provide intended results

Thank You

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