



## The Solutions Network

---

Rochester, New York

# O&M Training: Beyond Checking the Box

Energy 2004  
August 11, 2004  
Rochester, NY

Greg Sullivan  
Pacific Northwest National Laboratory



# Topics

---

- ❖ Need for Training
- ❖ Types of Training
- ❖ The “Training Plan”
- ❖ FEMP O&M Training
  - Classroom Training
  - Web-based opportunities





## Need for Training

---

- ❖ Systems and sophistication
- ❖ Staff turnover and corporate knowledge
- ❖ Contract/Contractor monitoring
- ❖ Safety

August 8-11, 2004

[www.energy2004.ee.doe.gov](http://www.energy2004.ee.doe.gov)



**CAUTION**

IF YOU THINK OSHA IS  
A SMALL TOWN IN  
WISCONSIN:

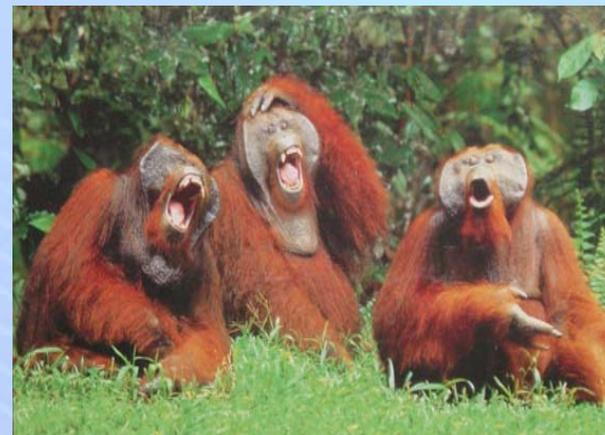
**YOU'RE IN TROUBLE!**

August 8-11, 2004

[www.energy2004.ee.doe.gov](http://www.energy2004.ee.doe.gov)

# 2004 Types of O&M Training

- ❖ On-the-Job (OTJ) Training
  - Mentor-based
  - Hands-on
  - 1-3 trained per session
- ❖ Classroom style
  - Instructor based
  - Workbook style
  - 10-50 trained per session





# Types of O&M Training

---

## ❖ Self-study

- Structured self-study (workbook/textbook)
- Video
- Computer-based (Web/CD)
  - Gaining popularity
  - Benefits:
    - Access/Availability
    - Self-paced
    - Continuing resource



## The *Training Plan*

---

- ❖ Each position within an O&M program needs to have a ***training plan***
- ❖ Existing methods of maintenance training planning...
  - Hey boss, look what came in the mail today ... can I go?
  - Hey boss, this training includes breakfast ***and*** lunch ...can I go?
  - Hey boss, this training is in San Diego ...***can we go?***



# Training Plan

---

## Development

- ❖ Position/facility priorities identified
- ❖ Existing staff capabilities defined
  - Deficiencies identified
- ❖ Training options documented
- ❖ Action plan created
  - Action plan revised and updated



# Training Plan Development

**Step #1:** Define position/facility priorities, for example:

- Safety
- Reliability
- Energy use
- Equipment longevity



# Training Plan Development

**Step #2:** Define the knowledge base necessary to meet priority

- Typically done by operator job task analysis
- Can be done as equipment-specific task analysis



# Training Plan Development

## Example: **Boilers/Boiler Operator Safety**

- ❖ Principles of combustion
- ❖ Properties of steam
- ❖ Equipment operation
  - Relief valves
  - Pressure vessels
  - Lock out/tag out
  - Low water implications

August 8-11, 2004

[www.energy2004.ee.doe.gov](http://www.energy2004.ee.doe.gov)



# Training Plan Development

---

## ***Reliability***

- ❖ Stand-by procedures
- ❖ Back-up procedures
- ❖ Multiple boiler operation
  - Scheduling
  - Sequencing

August 8-11, 2004

[www.energy2004.ee.doe.gov](http://www.energy2004.ee.doe.gov)



# Training Plan

---

## Development *Energy Use*

- ❖ Combustion efficiency
- ❖ Thermal efficiency
- ❖ System component efficiency
- ❖ System distribution efficiency
- ❖ Control

August 8-11, 2004

[www.energy2004.ee.doe.gov](http://www.energy2004.ee.doe.gov)



# Training Plan Development

---

## *Longevity*

- ❖ Performance of system
  - Performance trended
- ❖ Maintenance of system
  - Maintenance logged



## Training Plan

---

### Development

**Step #3:** Action plan created and training identified

- ❖ By position to identify necessary capabilities
- ❖ By position to identify code and regulatory compliance
- ❖ By position to identify organizational priorities



# Training Plan Development

## Step #4: Plan Implementation

- ❖ Review and update annually



Recommended annual training budget:

\$1,000 - \$2,000/staff



# FEMP O&M Training

---

- ❖ Mixed-Media Approach
  - Classroom/workbook
  - Select video topics
  - Group exercises
  - Hands-on (***New Addition***)

August 8-11, 2004

[www.energy2004.ee.doe.gov](http://www.energy2004.ee.doe.gov)



# FEMP O&M Training

---

- ❖ Networking Opportunities
  - Learn from each other
  - Share the lesson, what works/what doesn't
  - Future contacts and solutions
  - Federal-sector challenges

August 8-11, 2004

[www.energy2004.ee.doe.gov](http://www.energy2004.ee.doe.gov)



# FEMP O&M Training

---

- ❖ Goals of FEMP O&M Training
  - Access to resources
  - Access to equipment
  - Leave with an action

August 8-11, 2004

[www.energy2004.ee.doe.gov](http://www.energy2004.ee.doe.gov)



## FEMP Web-Based Training Pilot

---

- ❖ eLearning Pilot conducted by Apogee Interactive (Atlanta, GA)
- ❖ Using existing eLearning curriculum assess demand and usability issues in Federal sector
- ❖ Objectives:
  - Ease of use
  - Assess limitations
  - Identify early adopters
  - Recommend next steps

August 8-11, 2004

[www.energy2004.ee.doe.gov](http://www.energy2004.ee.doe.gov)



# FEMP Web-Based Training Pilot

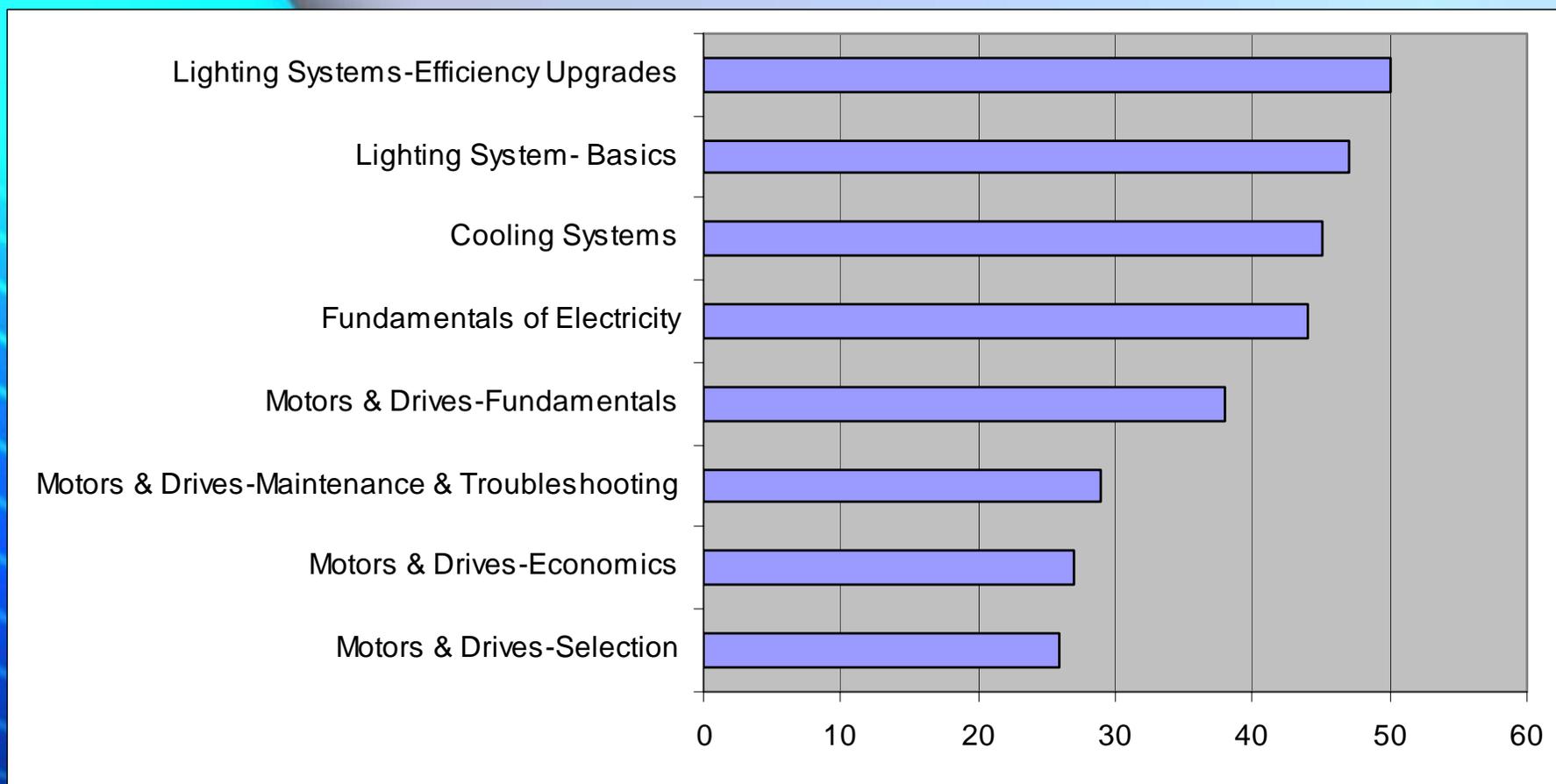
---

## ❖ Preliminary Results

- 87 Federal staff enrolled
- 16 different courses taken
- 84% “satisfied” or “very-satisfied” with course
- 95% rated system “easy” or “very easy” to use



# FEMP Web-Based Training Pilot



August 8-11, 2004

[www.energy2004.ee.doe.gov](http://www.energy2004.ee.doe.gov)



# FEMP Web-Based Training Pilot

---

- ❖ Next steps:
  - Complete evaluation
    - Phone interviews with participants
    - Final report due August 23, 2004
  - Consider O&M-Specific content development
  - Potential future opportunities:  
check FEMP O&M website

August 8-11, 2004

[www.energy2004.ee.doe.gov](http://www.energy2004.ee.doe.gov)



## Contact Information

---

Ab Ream, FEMP O&M Program Manager  
ab.ream@ee.doe.gov

Dave Hunt, PNNL O&M Program Manager  
dave.hunt@pnl.gov

Greg Sullivan, PNNL  
gp.sullivan@pnl.gov

*FEMP O&M Website*

[http://www.eere.energy.gov/femp/operations\\_maintenance/](http://www.eere.energy.gov/femp/operations_maintenance/)



# Questions?

---



August 8-11, 2004

[www.energy2004.ee.doe.gov](http://www.energy2004.ee.doe.gov)