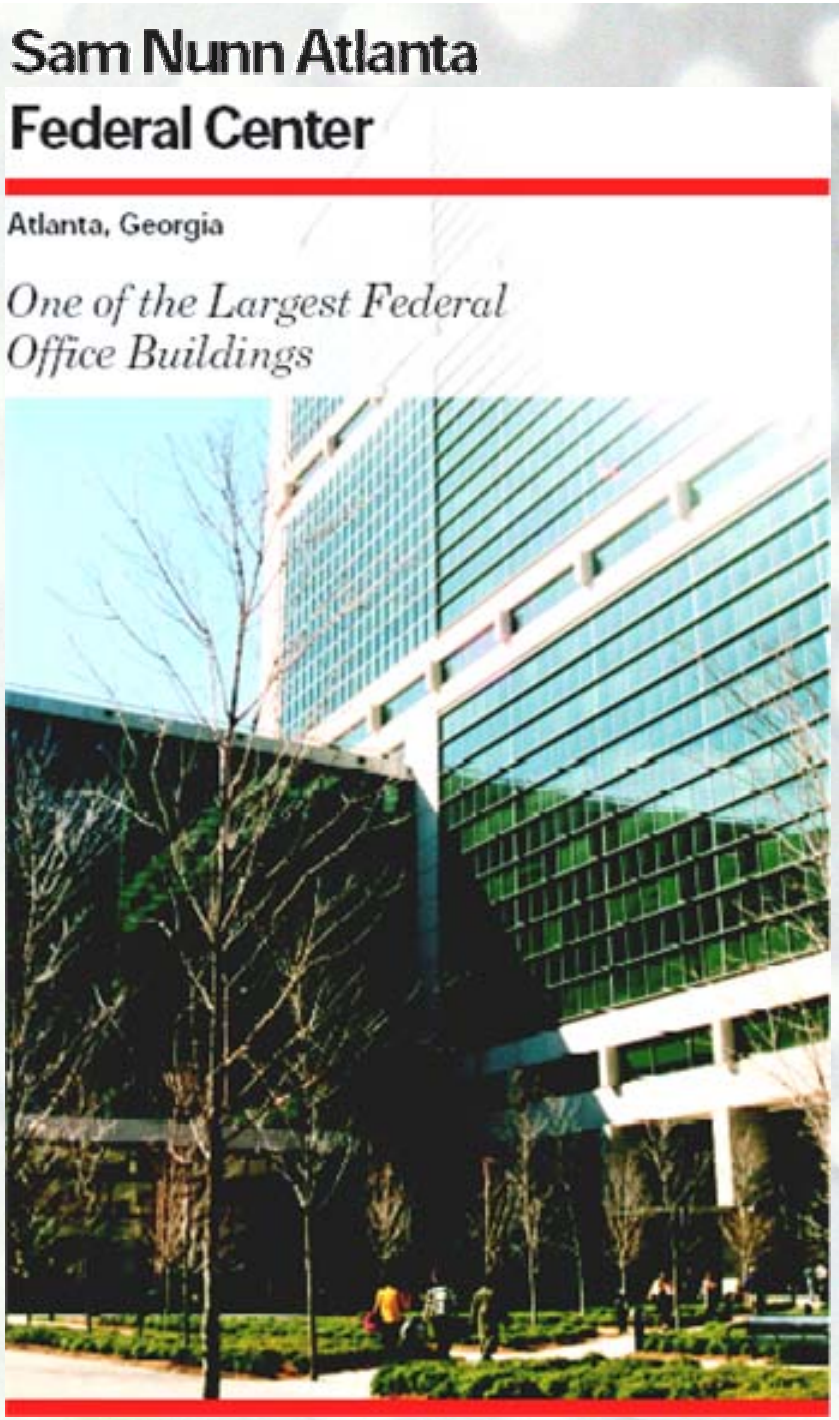


LED Egress-Lighting Project

Danny M. Orlando
Energy Star Coordinator
EPA Region 4 - Atlanta

Facility Overview

24 story tower
Mid-Rise
Bridge

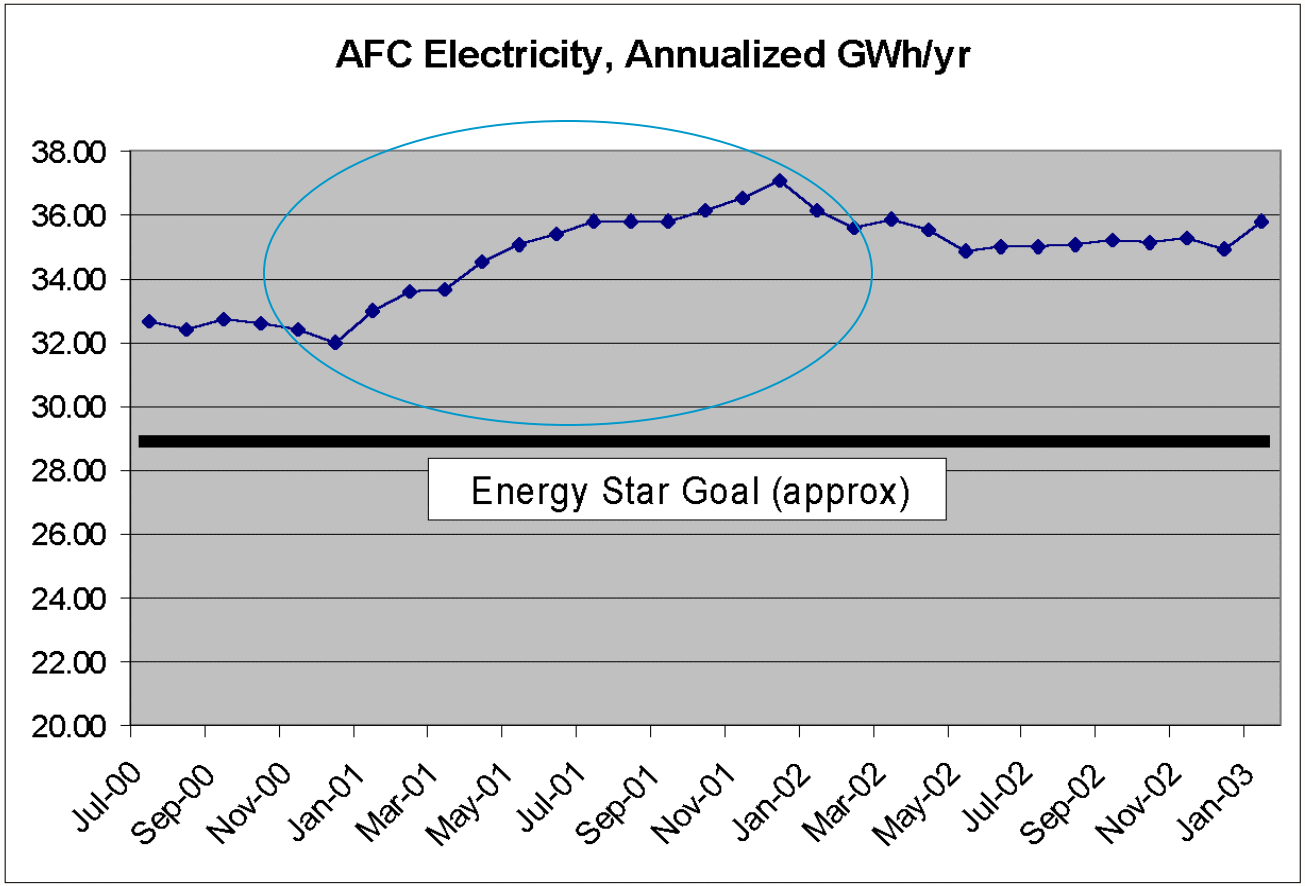
7/3 story garage
1924 building

2 million ft^2
4400 workers

36 GWh/yr - energy usage
$1.5 million/yr - energy cost
4.2 cents/kWh

~20% reduction in energy usage needed to attain Energy Star

Energy Management - Not at its Best

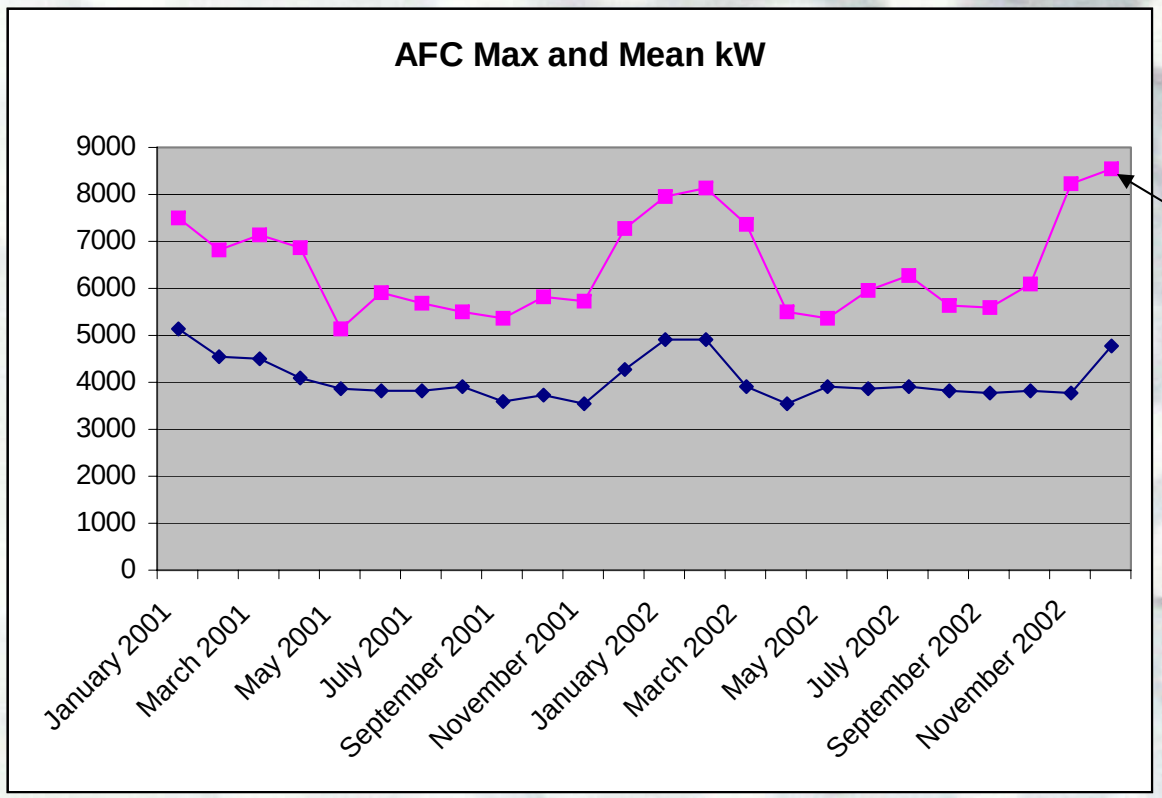


81.9 kBtu/ft^2

Driving Forces

Reliability-centered capacity of the transformer = 8 MVA

Actual limit = 10 MVA



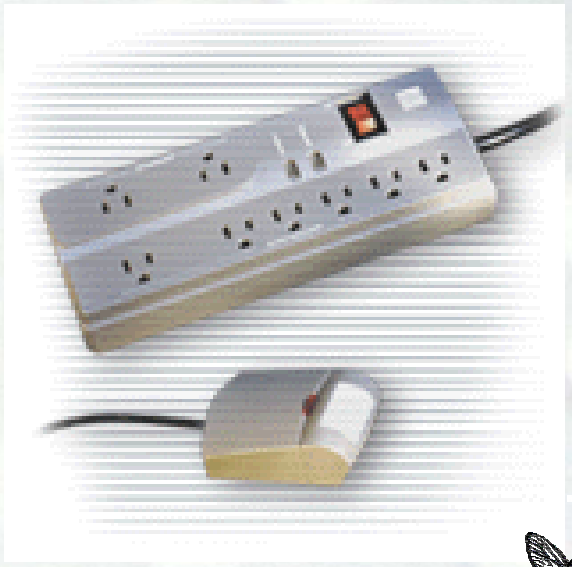
Both have been exceeded!

AND…the building next door is

Measurement Project - 15th Floor

Egress lighting energy reduction and lighting improvement

Plugload control



Overhead lighting controls

Measurement

LED Egress Project

(Retrofit Case)

ASK ABOUT ENERGY STAR

Before

42 (2x4) 3-T8 lamp troffers
on emergency circuit
8760 hours/yr
106 watts/each
39,000 kWh/year

19,939 kWh

After

42 (2x4) troffers moved to
main overhead circuit
3875 hours/yr
106 watts/each
17,251 kWh/year

93 White LED egress strips at
3.3 watts/each on
emergency circuit
8760 hours/year
2,688 kWh/year

LED Egress Project

(Retrofit Case)

19,059 kWh/year reduced

13 TPY CO2 reduction

$800/year - 14 year payback

[@4.2 cents/kWh (actual rate)]

$1,429/year - 7.7 year payback

[@7.5 cents/kWh]

LED Egress Project

(New Construction Case)

42 emergency troffers/floor using 39,000 kWh/yr
$1,638/yr

Or

93 LED strips/floor using 2,688 kWh/yr
$113/yr

7.2 year payback at 4.2 cents/kWh

Project cost - reasonable and customary:
~ $50-60/ white LED fixture = $5500
~ same cost for installation = $5500

LED Egress Project -

Other Benefits/Cost Savings

Ancillary Benefits:

Emergency backup power usually means a Gas or Diesel Generator (1st Cost, maintenance staff, fuel, and clean air regulations)

LED system can be run on an uninterruptible power supply (UPS)

General maintenance on the system should be near zero for 8-10 years.

I hypothesize that:

LED emergency lighting will penetrate smoke much better than fluorescent lighting

LED Egress Project -

Before

Measured -
18 fc under
0.2 fc between
1.7 fc intermediate

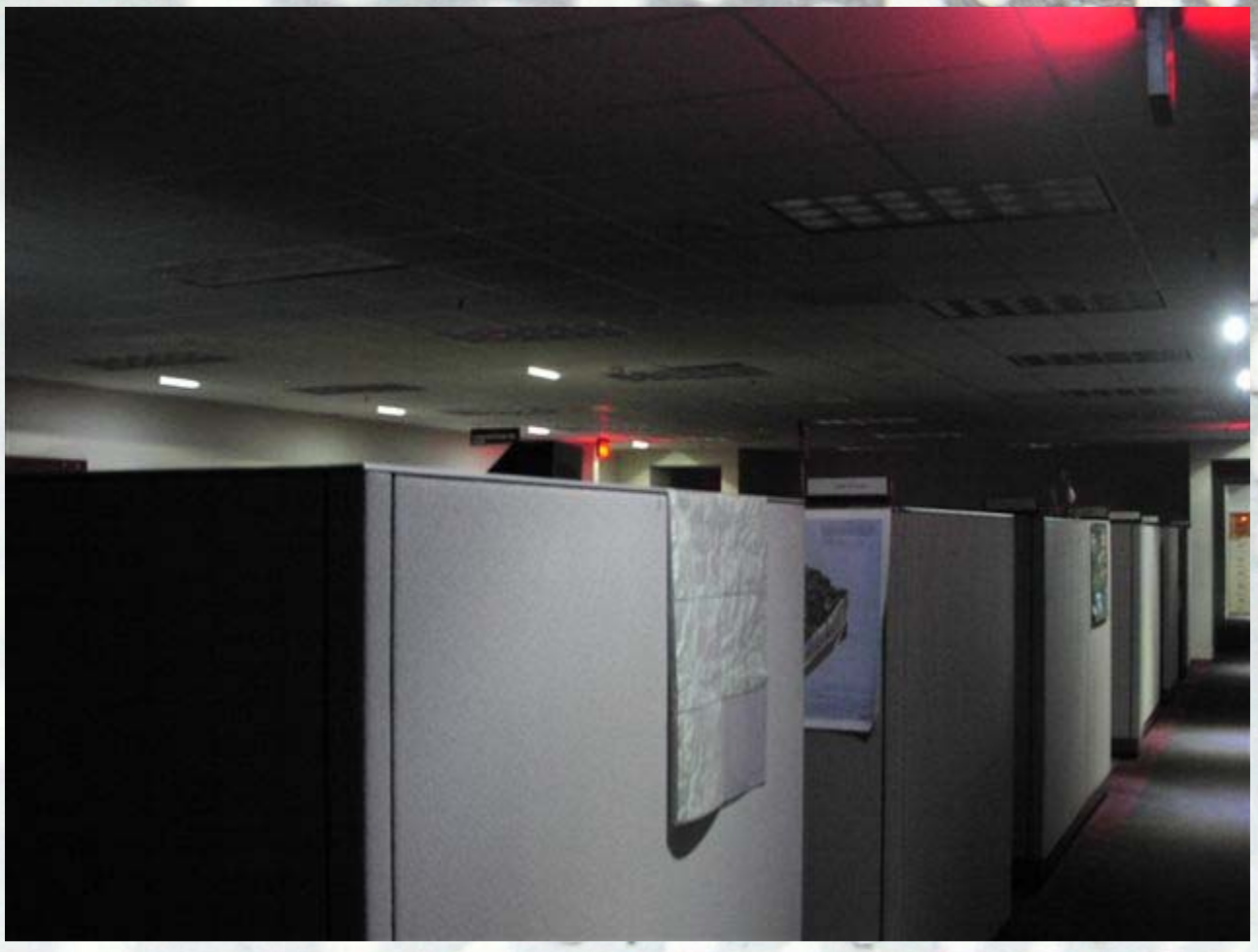
Fire Code -
1.0 fc avg at floor
min. of 0.1 fc

LED Egress Project -

After

Measured -
1.7 fc under
0.2 fc between
on 10 foot ctrs.

Fire Code -
1.0 fc avg at floor
min. of 0.1 fc



LED Egress Project -

After

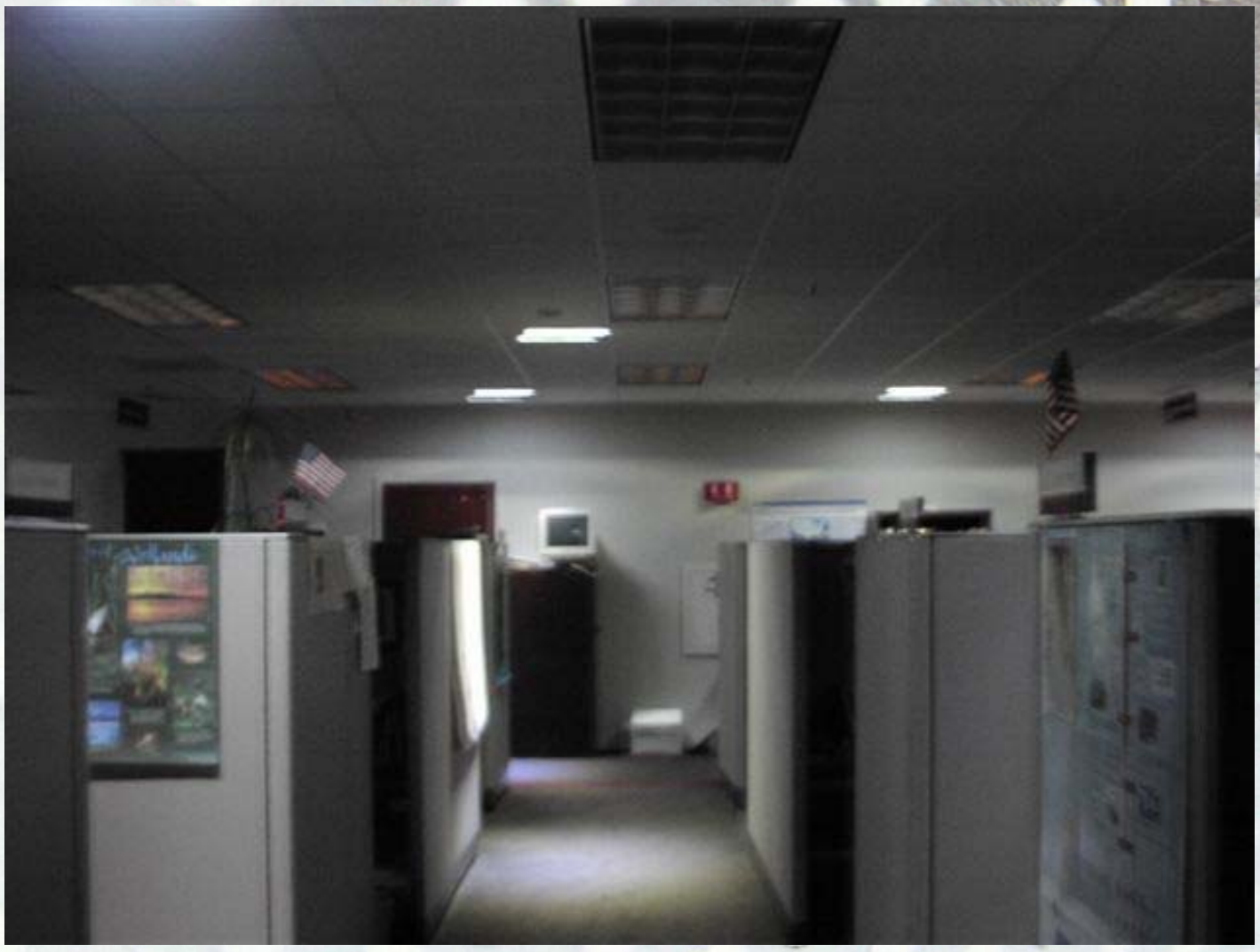
Suggested spacing:

8-10 foot on center

LED's throw an 8 foot circle from 9-10 foot ceiling height

LED Egress Project -

After



LED Egress Project -
Discussion

Price issues:

Installation performed in house will reduce cost.

Install a demo area to fine-tune installation methods and to reduce labor costs.

Product issues:

Amber LED cost 50% less, use more energy, and last longer

Spend time - learn/practice how to cut the ceiling tile
learn/practice installing properly/consistently

24/7 runtime = 10 years expected life

UL listing preferred in future installations


CHANGE FOR
THE BETTER WITH
ENERGY STAR