



# ***Proposal for 2008 Title 24 Global Temperature Adjustment (GTA)***

February 23, 2006

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07-BS TD-1

DATE FEB 23 2006

RECD. APR 29 2008

# Proposal for 2008 Title 24 - Global Temperature Adjustment (GTA)



**Applicable to:**

- **Non-Residential (Commercial Buildings)**
- **New Energy Management Control System (EMCS)**

# Based on PIER / DRRC Research



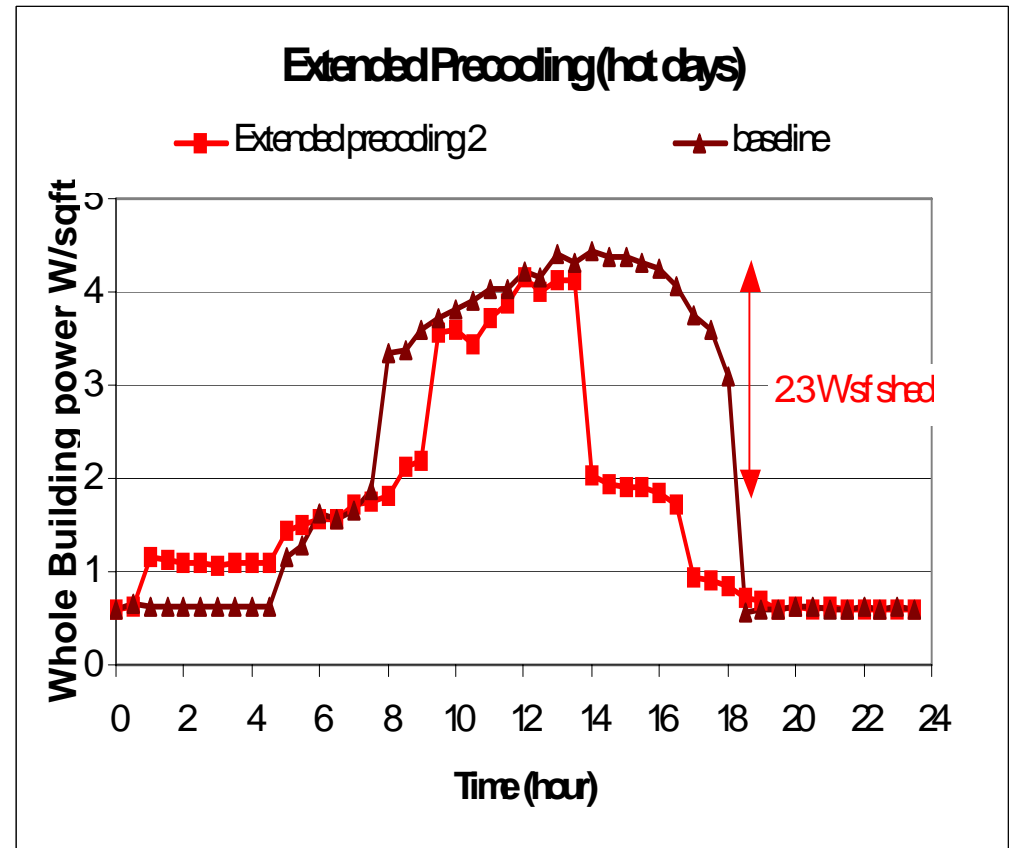
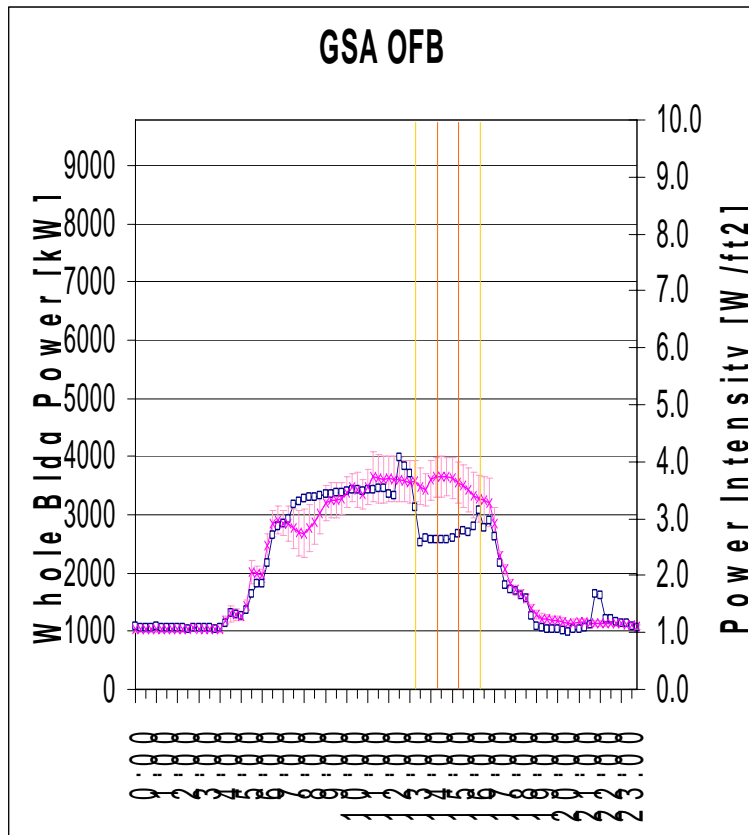
- **Field Studies by Demand Response Research Center in 2003 - 2005**
- **Over 10 Million ft.<sup>2</sup> commercial floor space tested**

# Proposal is Intuitive:



During DR events:

- Turn cooling setpoint up
- HVAC systems “coast” to provide savings



# GTAs not available in most buildings



- **Not in existing buildings**
- **Not in new buildings**
  - This is what we hope to change through Title 24

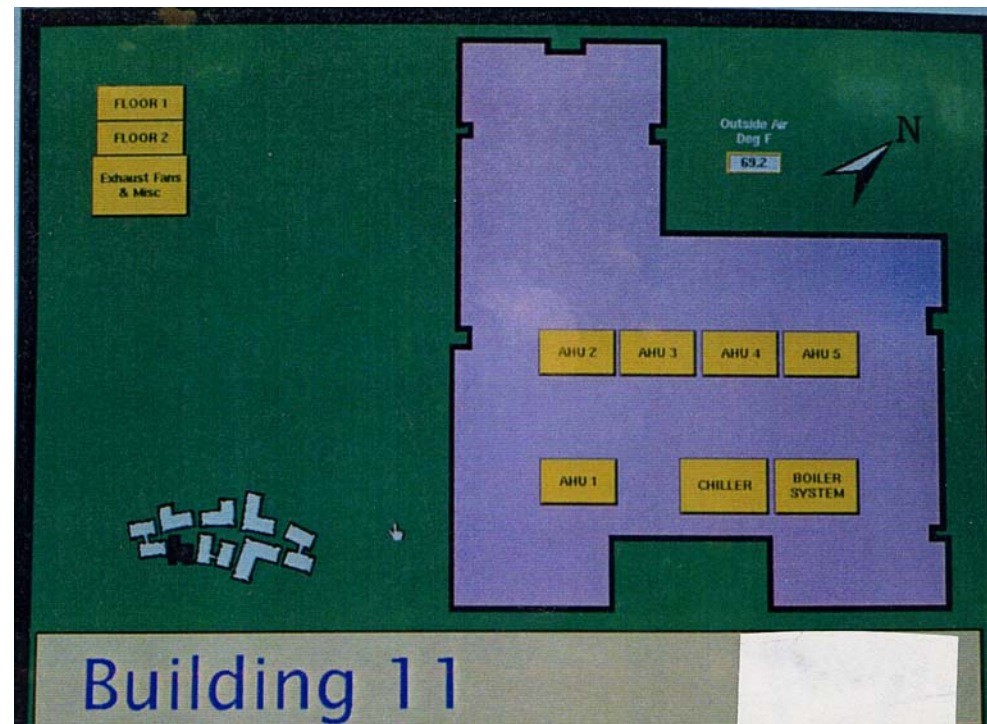
# Typical EMCS Temperature Adjustment



- The setpoint for each “zone” is adjusted individually.
- Up to 1,000s of zones per facility.
- Not practical to adjust whole site manually

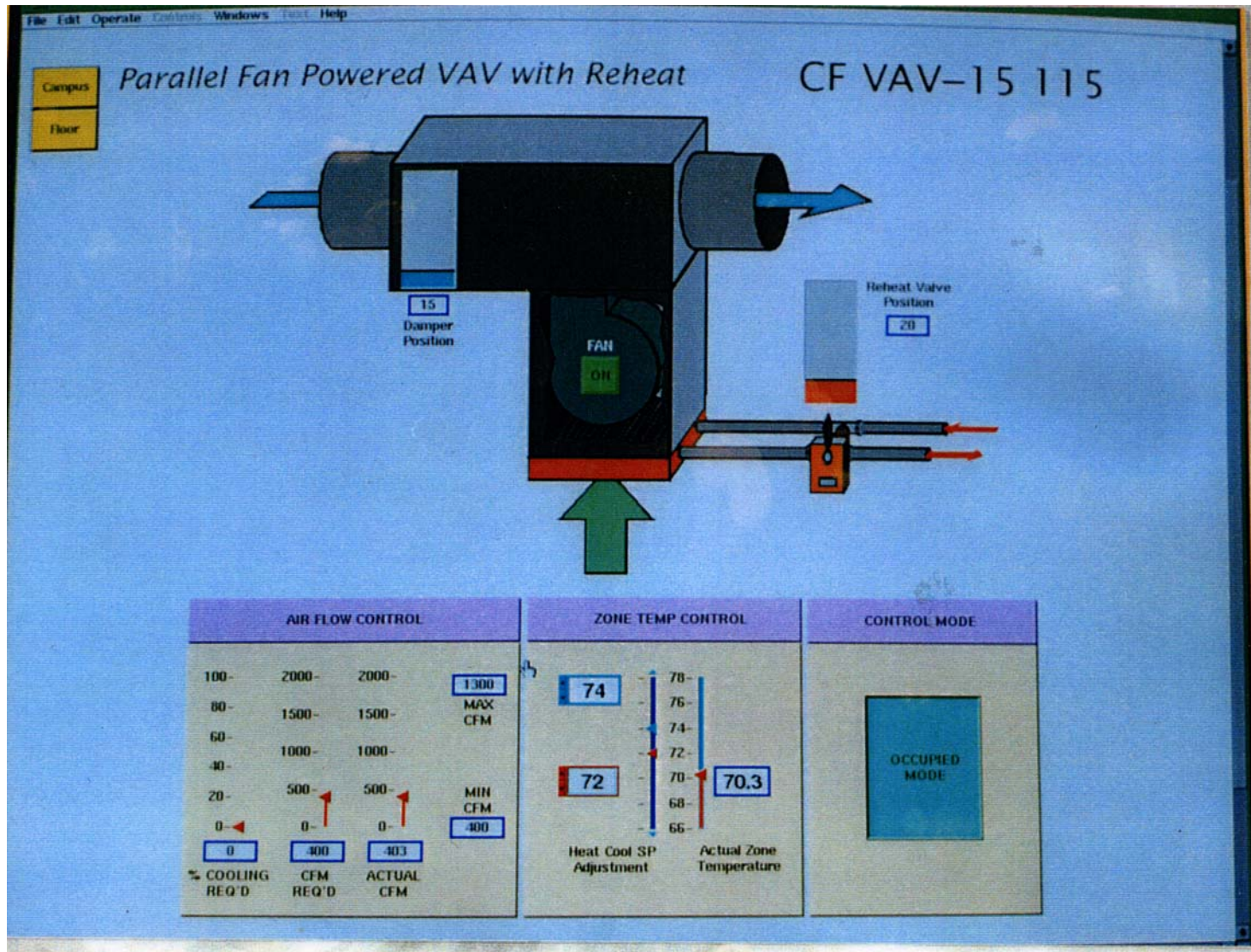


# Typical EMCS Graphical User Interface

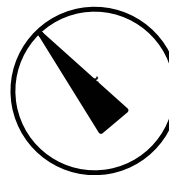
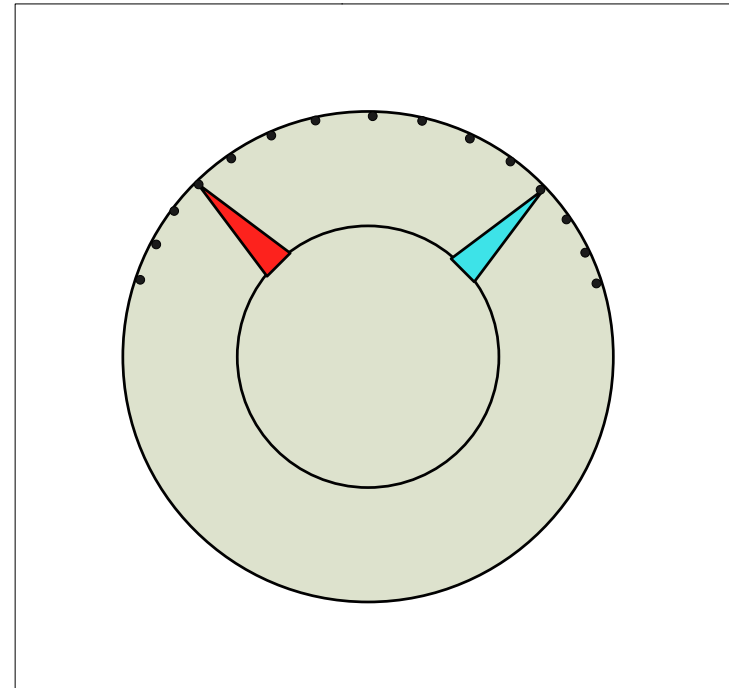




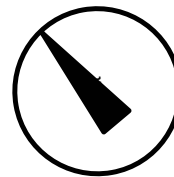
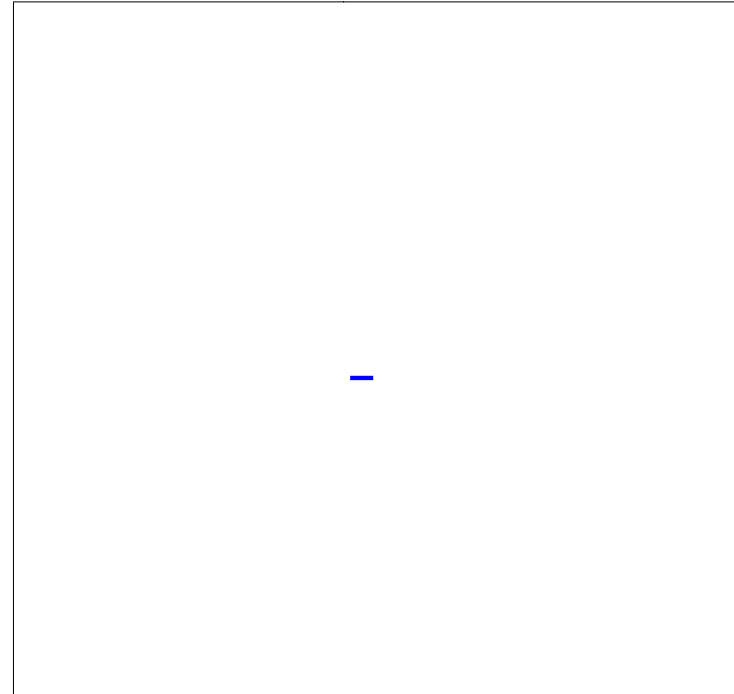
# Typical EMCS – Individual zones Adjustment



# GTA – Conceptual Implementation #1 (Absolute)



# GTA – Conceptual Implementation #2 (Relative)



# Cost to Implement GTA



- **Software only – no hardware cost.**
- **Several (smaller) vendors already offer this feature at no extra cost.**
  - Sold nationwide
- **Remaining vendors can add GTA to standard product line at a low one-time cost.**
- **Similar global features are common this industry (e.g., night setback).**

# Cost / Benefit Summary



- **Costs to implement GTA are negligible**
- **Benefits to commercial building managers and the electric grid are substantial:**
  - **Enables Demand Response (remotely initiated, economic or contingency driven)**
  - **Enables Demand Management (daily on-site peak mngt)**

# GTA is Simple



- **No new signal infrastructure req'd**
  - Inform building managers via pagers & e-mails
- **Enables future DR signals**
  - 95%+ effort accomplished through GTA
- **Compatible with 1-way and 2-way AMI systems**

# **Proposed Code Language – Section 122 (b):**



**4. In facilities with multiple space-conditioning zones for comfort heating or cooling, each controlled by an individual thermostatic control, authorized personnel shall have the capability to perform Global Temperature Adjustment (GTA) of the setpoints of all zones simultaneously from a single location. The centrally generated GTA command shall cause the thermostatic control of each individual zone to increase cooling setpoints by at least 3° F and decrease heating setpoints by at least 3° F.**

**EXCEPTION to Section 122 (b) 4: Systems with stand-alone thermostats that are not connected via an Energy Management and Control System (EMCS) communication network.**

# Questions & Comments?

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# Results using GTA (2003-2005)



Site name	Area (ft <sup>2</sup> )	Cooling Capacity (Tons)	Strategy Used	# Days of Testing	Climate Zone	Outside temperature at time of peak	Average shed (W/ft <sup>2</sup> )*	Peak shed (W/ft <sup>2</sup> )
GSA Oakland Federal Building	978,000	3,840	Global Temp Adjustment	4	3	88	0.30	1.10
Contra Costa County 2350 Arnold	131,000	240	Global Temp Adjustment	2	12	90	0.30	0.67
Contra Costa County 50 Douglas	90,000	240	Global Temp Adjustment	2	12	90	0.58	1.34
GSA Santa Rosa Federal Building	80,000	200	Global Temp Adjustment*	20	2	95	1.50	2.40
Sacramento County Building	80,000	180	Global Temp Adjustment*	3	12	70	0.75	1.00
Cisco	4,354,000	24,600	Global Temp Adjustment & other strategies	1	4	90	0.16	0.20
Echelon	75,000	4,800	Global Temp Adjustment & other strategies	2	4	90	0.89	1.22