

FPL On Call – 1,000 MW and Eighteen Years Later

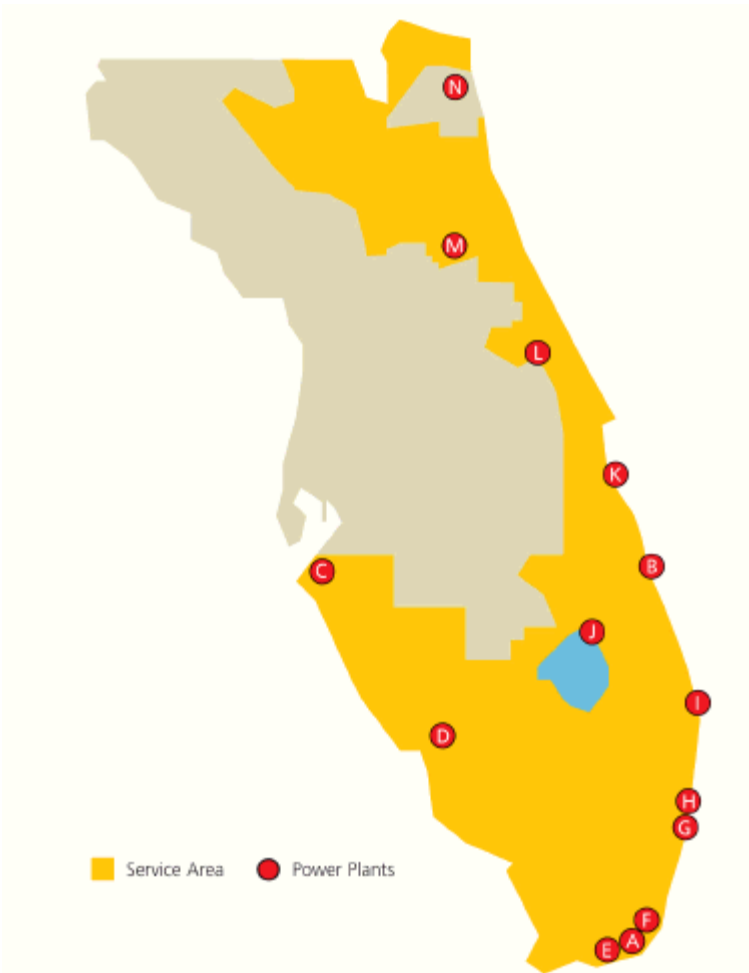
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Florida Power & Light – Today



- 9,600 Employees
- 4.1 million customers
- Half of Florida
- 86 Generating Units
- 500 Substations
- 69,000 miles of transmission and distribution lines



FPL – 2003

<u>Sector</u>	<u>Number of Accounts</u>	<u>Total Sales (kwh)</u>
Residential	3,653,000	52%
Commercial	445,000	40%
Industrial	17,000	4%
Other	3,000	4%

Average Monthly Energy Usage per Customer (in kWh)

	<u>Residential</u>	<u>Commercial</u>	<u>Industrial</u>
2003	1,220	7,764	19,591
2002	1,189	7,663	21,764
2001	1,136	7,416	22,070
2000	1,131	7,425	19,129



Peak Energy Use – Systemwide

<u>Season</u>	<u>Date</u>	<u>Megawatts</u>
Summer	July 14, 2004	20,545
Winter	January 24, 2003	20,190

**Residential Contribution to System Peak
Approximately 50%**

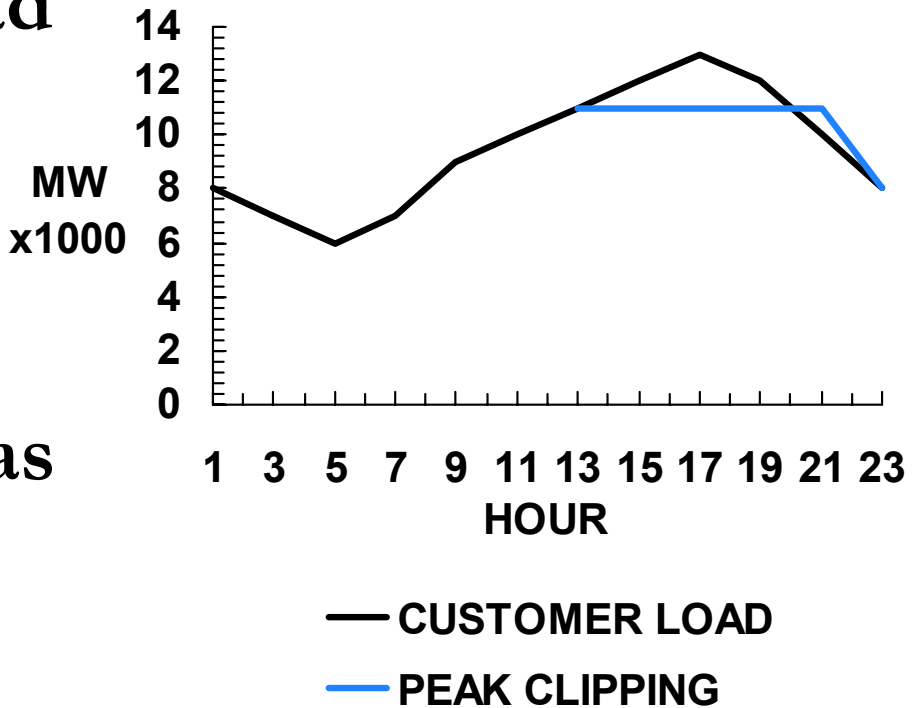
Why Direct Control ???

- FPL needs to satisfy the Peak Demand for electricity
- Peak Demand occurs for only a few hours each year
- Historically, FPL built power plants to satisfy the Peak Demand
- Dependable - **The MW's are really there**
- Simple, automated, and customer-friendly

Demand Reduction – Peak Clipping Through Direct Load Control

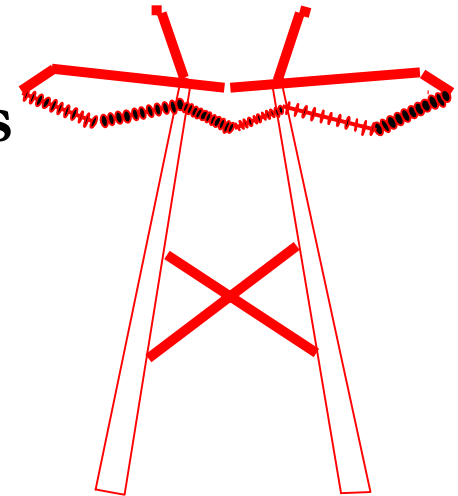
- Shapes the utility load curve
- Reduces Peak Load Growth
- Don't need to build as many power plants
- Results in lower Electric Rates

LOAD CURVE



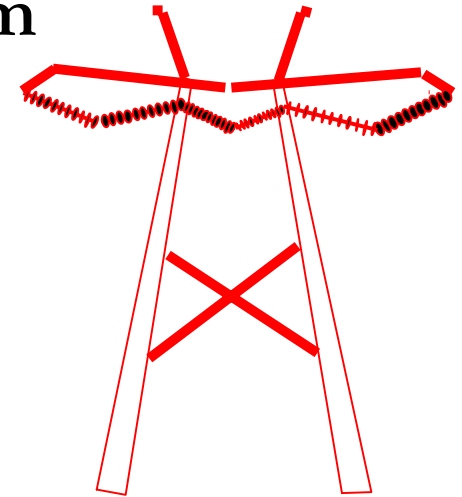
Load Control Programs at FPL

- Commercial and Industrial - CILC & CDR
 - Direct Control - Bidirectional w/customer feedback
 - Wireless Public Network Communications System - CDPD / CDMA
 - Telephone units fill in coverage holes
 - First units installed in 1987
 - 520 Customers
 - 450 MW Peak Demand Reduction
 - Customer savings: 5% to 20% typical
 - Requires Advanced Metering



Load Control Programs at FPL

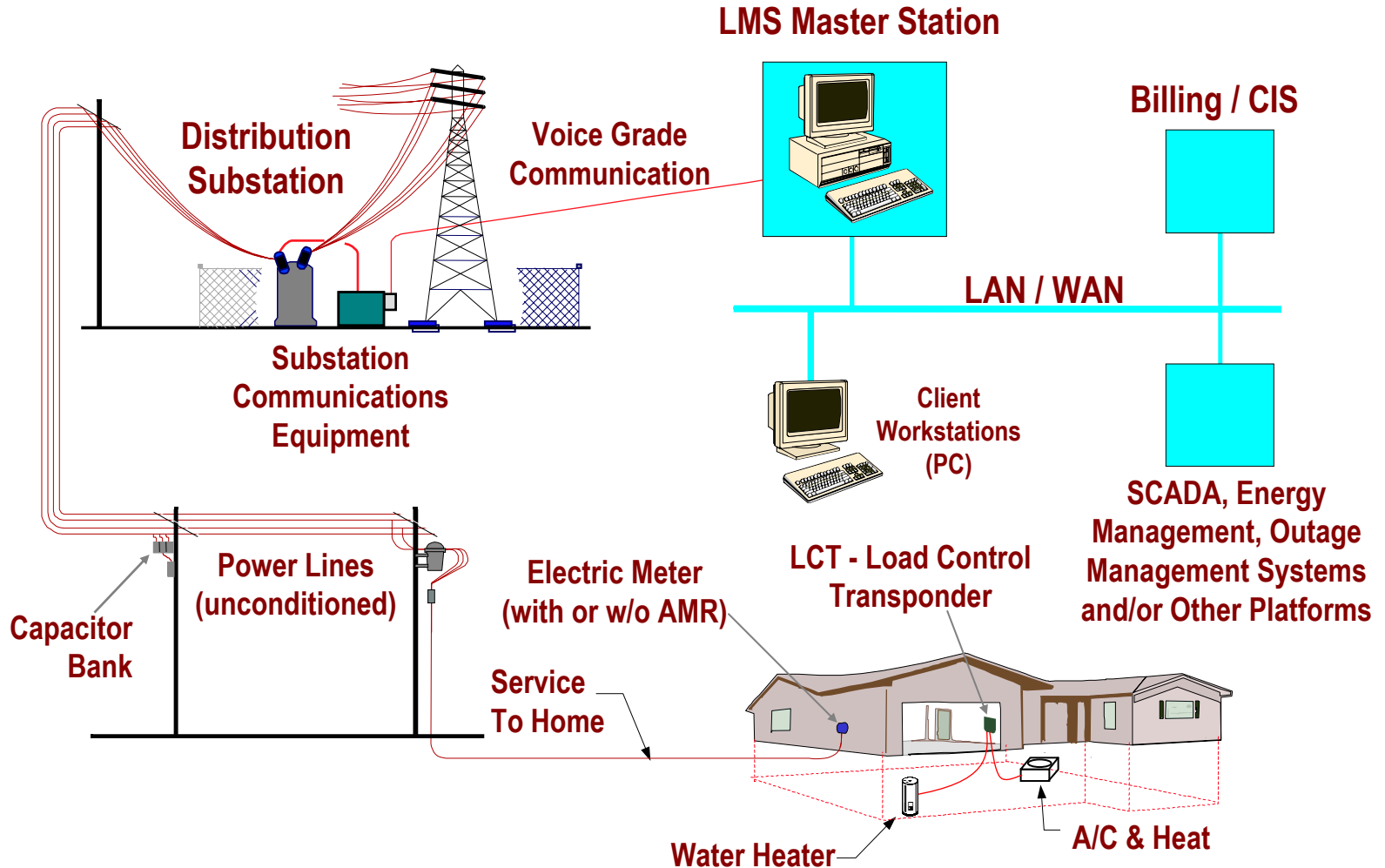
- Residential and Business On Call
 - Direct Control - Bidirectional
 - Powerline Communications System
 - First units installed in 1987
 - 710,000 Customers
 - 815,000 Transponders
 - 1,000 MW in normal operation
 - 2,000 MW in an emergency - SCRAM
 - 460 Substations equipped for On Call
 - Does not require Advanced Metering



Residential and Business On Call

- Extensive research up front
 - Appliance saturation and sizing
 - End-use load research
 - Customer focus groups
- Pilots to test load control strategies
- Models
 - Predict MW attainable based on weather and other variables – System Control Center
 - Validation & monitoring
 - Two-way transponders allow verification of operation, i.e. loads are actually interrupted

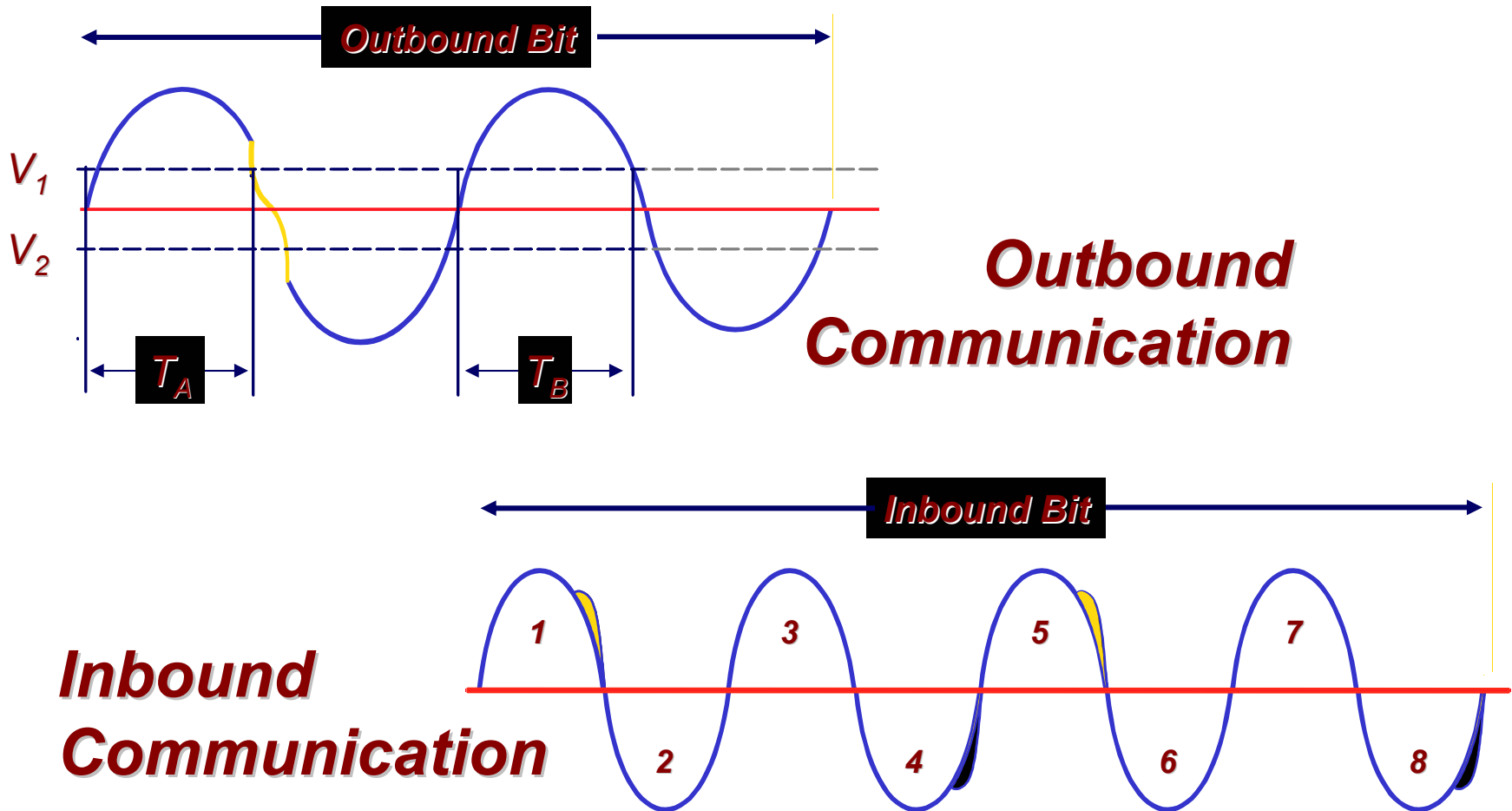
Residential and Business On Call



Major Components of LMS

- **LMS - Load Management System - Master Station computer located in FPL's System Control Center (EMS)**
- **SCE - Substation Communications Equipment - Computer and power equipment located in each TWACS equipped substation**
- **RCE - Remote Communications Equipment - Field equipment: Boxes and under-glass modules that do the work at each customer**

The TWACS[®] Technology



Residential Load Control-On Call

- Appliances placed “On Call”
 - Central Air Conditioning
 - Cycle - 15 minutes off, every 30 minutes, for 3 hours
 - Extended - 3 consecutive hours off in 24 hours
 - 7 months: April through October
 - Central Strip Heat
 - Cycle - 15 minutes off, every 30 minutes, for 3 hours
 - Extended - 4 consecutive hours off in 24 hours
 - 5 months: November through March

Residential Load Control-On Call

- Appliances placed “On Call” - continued
 - Electric Water Heaters
 - Extended - 4 consecutive hours off in 24 hours
 - 12 months: year round
 - Swimming Pool Pumps
 - Extended - 4 consecutive hours off in 24 hours
 - 12 months: year round

Residential On Call Incentives

- Incentive Payments per Year
 - Air Conditioning Cycle: \$42 old / \$21 new
 - Air Conditioning Extended: \$63
 - Strip Heat Cycle: \$10
 - Strip Heat Extended: \$20
 - Water Heat: \$42 old / \$18 new
 - Pool Pump: \$36
 - Total per customer: Typical \$80 old / \$45 new
- New incentive \$\$ apply to customers signing up or changing after April 1, 2003

Business On Call

- **Direct Expansion (DX) Air Conditioning**
 - Cycle - 15 minutes off, every 30 minutes, for 6 hours maximum
 - 7 months: April through October
 - Must use AC from 3-5 PM, 4 days / week
 - Incentive: \$2 per ton, per month
 - 20 tons per customer - typical today
 - 16,000 Customers
 - 42 MW in normal operation
 - 83 MW in an emergency - SCRAM

Demand Reductions Attained

Typical Demand Reduction (kW) At the Generator - Summer

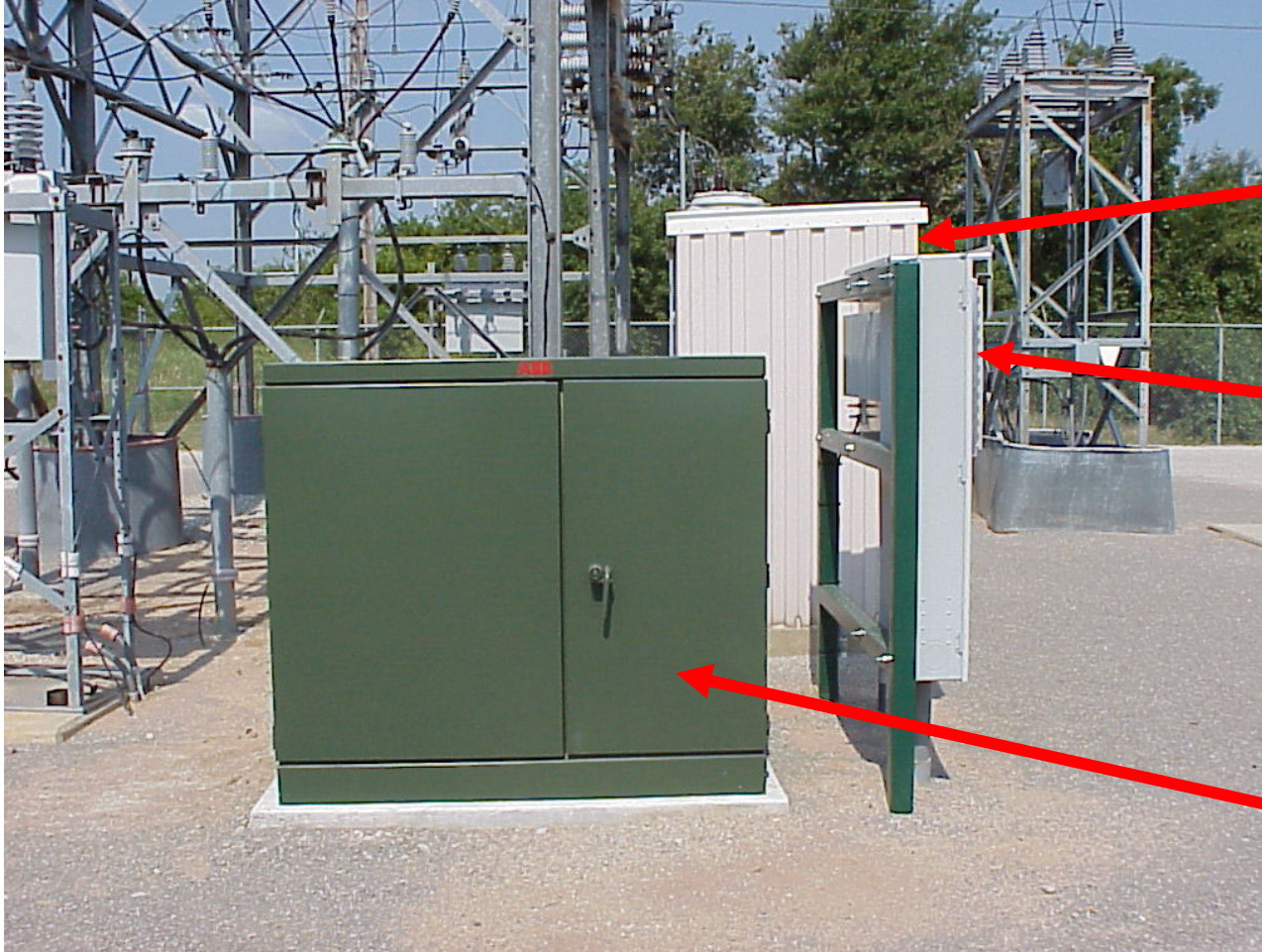
Residential Normal 1.44 kW Per Customer

Residential SCRAM 2.77 kW Per Customer

Business Normal 0.34 kW Per Ton

Business SCRAM 0.78 kW Per Ton

Substation Control Equipment



Control &
Receiving Unit
(inside building)

Outbound
Modulation Unit

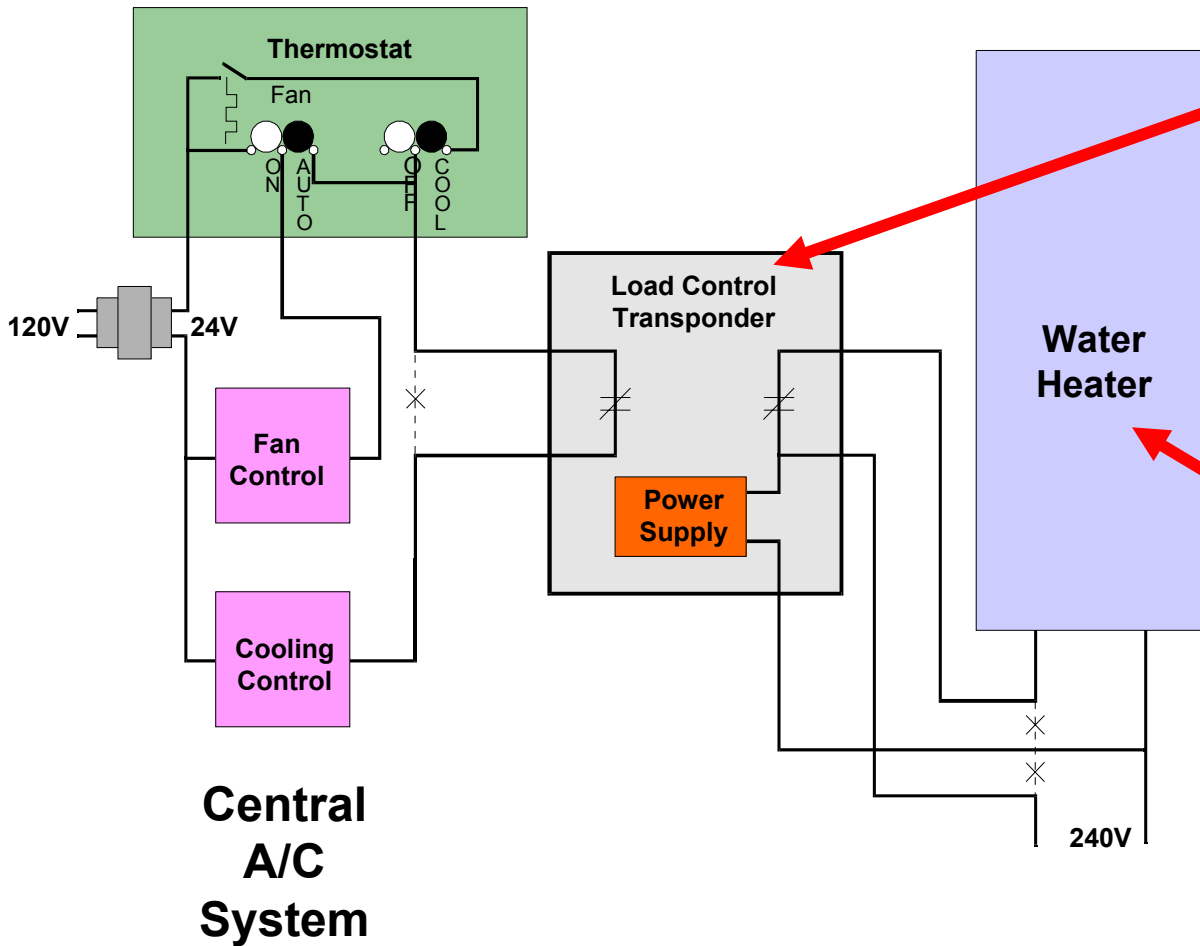
Modulation
Transformer Unit

Load Control Transponder – LCT

- Remote Control of “convenience” loads to reduce peak demand
- Two-Way to confirm receipt of commands
- Monitors loads to measure effectiveness
- Independent control of two appliances
- Autonomous “cycling” of appliances
- Downloadable addresses and shed strategy



Typical Installation – Water heater & central AC



Typical Installation – Second central AC



Business On Call Installation



TWACS[®] Also Does AMR at FPL

- Uses same communications infrastructure as On Call
- 40,000 Meters today
- Residential customers
- Hard to read: Fences, dogs, inside meters, etc.
- Safety concerns
- In service for approximately 15 years
- Have worked well
 - Met all the above objectives
 - Expanded benefits - outage detection, revenue protection & care center support

New Generation of Advanced Meters

- **Outage Detection**
- **Outage Extent Mapping**
- **Outage Restoration Monitoring**
- **Momentary Interruption Monitoring**
- **Outage Status to Customers**
- **Integrate with utility CIS, OMS, GIS & WMS systems**
- **Highly automated**

New Generation AMI – continued

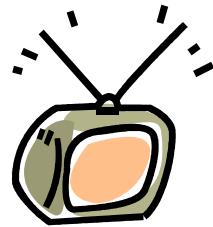
- **Power Quality Monitoring**
 - “Bread and butter” Advanced Meters are getting good enough to replace “high end” Smart Meters like FPL’s SmartSynch PQ Monitoring System
 - Outage Detection
 - Voltage Monitoring
 - Momentary Interruption Monitoring
 - Automated messages to customers & acct mgrs
 - Automated Trouble Tickets
 - Remote monitoring & follow-up

New Generation AMI – continued

- **Improvement to Reliability Indices**
- **Care Center Support**
 - **Billing problem resolution**
 - **Off-cycle / Final reads**
 - **Real time troubleshooting**
- **Remote Connect / Disconnect**
- **Asset optimization – right-sizing equipment**
- **Revenue Protection / Assurance**

Customer Promotion

- In the beginning
 - FPL promoted On Call very heavily
 - Residential only
 - Print ads
 - TV
 - Bill inserts
 - Word of mouth
 - Very popular program
 - Thousands and thousands of customers signed up



Customer Promotion – continued

- Today
 - Business On Call - Targeted marketing
 - Residential On Call - No marketing
 - Number of MW is capped
 - Word of mouth
 - Friends, neighbors, relatives
 - 300 calls a week
 - Web site - 60 inquiries a month
 - Closure rate: 80% to 85%
 - Still very popular



Customer Inconvenience

- The key to successful Direct Load Control is a proper understanding of customers and their feelings ... **Surprise ... Surprise !!!**
- Extensive, up front, research must be done to find out the points where
 - Customers notice your are controlling them
 - Customers get upset enough to exit the program
- FPL does an excellent job - The proof is in the pudding ... very few customers ever drop out

When Customer Moves

- LCT remains in place
- Immediately after the electric service is made active, the new customer is sent a letter...
 - **“Congratulations”** ... you are very fortunate to have moved into a home equipped with On Call ...
 - On Call details and credit amount are provided
 - “Thanks for your participation” ...
 - You can request On Call be changed or deactivated any time you are unhappy with it



Customer Moves – continued

- The new customer's response
- Virtually 100% are happy to try out On Call
- Very few ever call back later to get On Call deactivated
- The customer is happy with the credit \$\$
- FPL is happy ... it's investment is preserved
- Everybody wins ... what a deal !!!

Direct Load Control – On Call

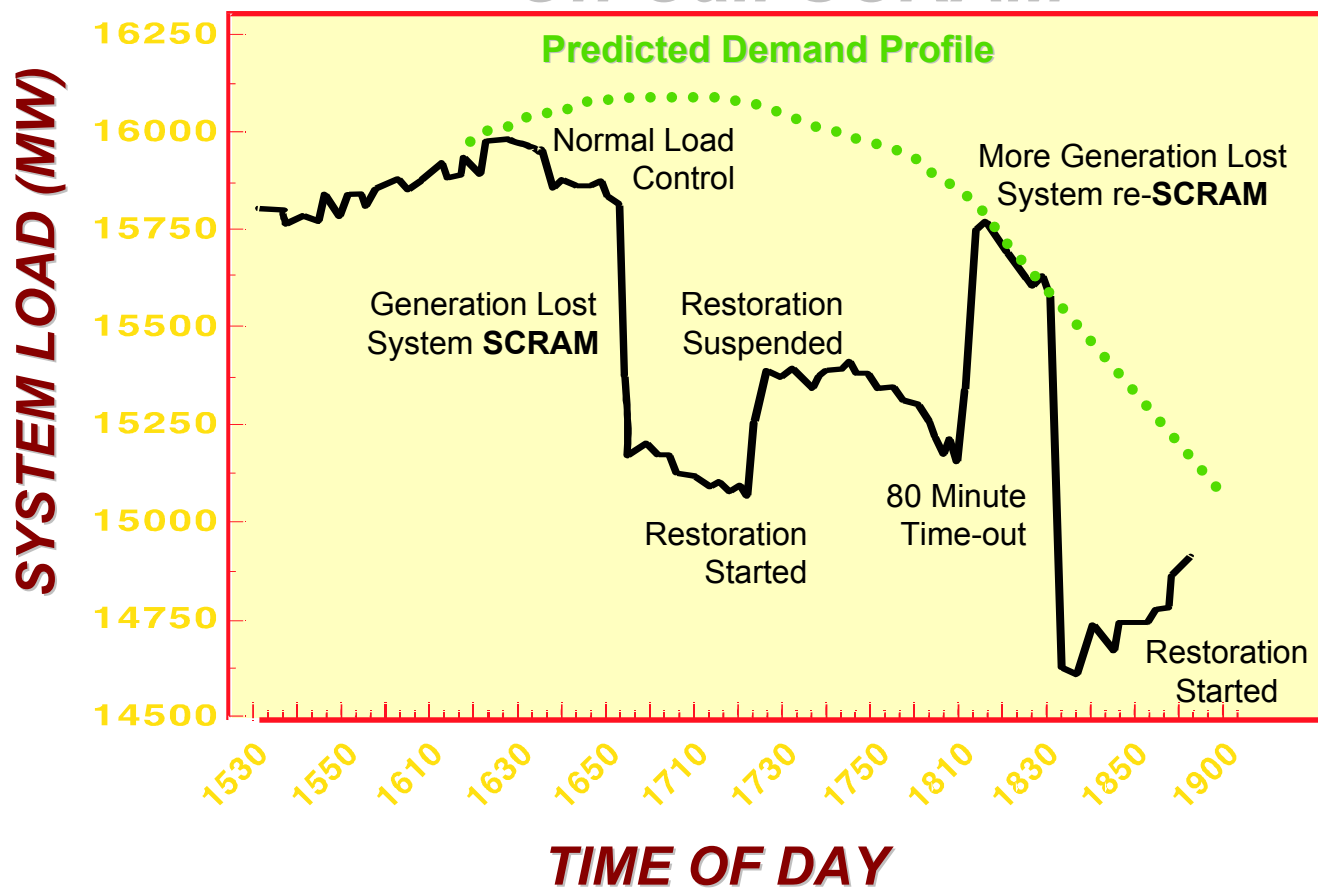
- Customers get to:
 - Choose to participate or not
 - Choose the devices controlled
 - Central Air Conditioning
 - Central Strip Heat
 - Water Heater
 - Swimming Pool Pump
 - Set the degree of “inconvenience” experienced
 - Cycling strategy
 - Extended strategy

What do Customers Say ??

- They like the money - the incentive payments are looked upon as “free money” 
- Once signed up, there is nothing further they need to do - it is easy, automatic, and the credit appears on their bill every month, regardless of whether FPL does control or not
- Customers appreciate being part of the solution to the country’s energy problems 
- Since most can’t even tell when FPL is doing control, there is no inconvenience ...

Does On Call Work ???

On Call SCRAM



**Over 975
Megawatts
Shed in 60
Seconds**

August 1995

**Today Have
2000 MW
Available for
SCRAM**

Other Examples

- Most On Call activations were in response to system capacity shortages created by:
 - Extremes in weather
 - Generating units tripping offline
 - Other emergencies - gas pipeline explosion
- On Call can be activated to relieve localized trouble
 - Transmission constraints - fires under 500 kV
 - Voltage / VAR / Stability problems
 - Individual substation overloading - outage and weather
- It works just as intended ... that's a very good thing !!!

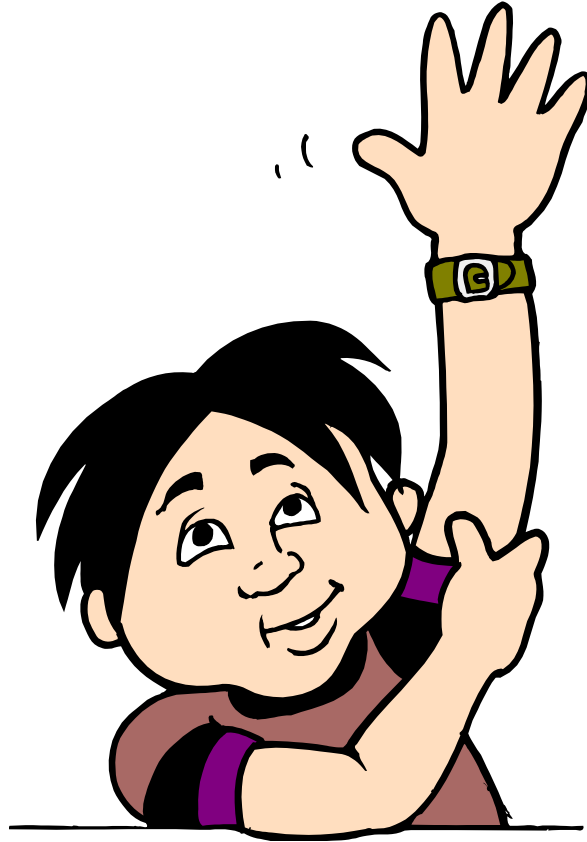
FPL – All Load Mgt Programs

- **FPL actively works with customers to help them reduce their use of electricity & control their bills.**
- **These programs remain among the most effective in the nation**
- **Rate Impact Measure (RIM) test puts On Call at a cost-benefit of 1.3**
- **In total, have reduced enough electricity demand to date (4,100 MW) so that FPL has been able to avoid building the equivalent of 10 (400 MW) power plants.**

Conclusions

- Load Management remains a key component of the Utility Integrated Resource Planning process at FPL
- Load Management should include
 - Demand Response and Direct Load Control
 - Traditional DSM programs
- Each program fills it's piece in the puzzle
- Don't abandon traditional ideas just because they lack some glitz

Questions ?????



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