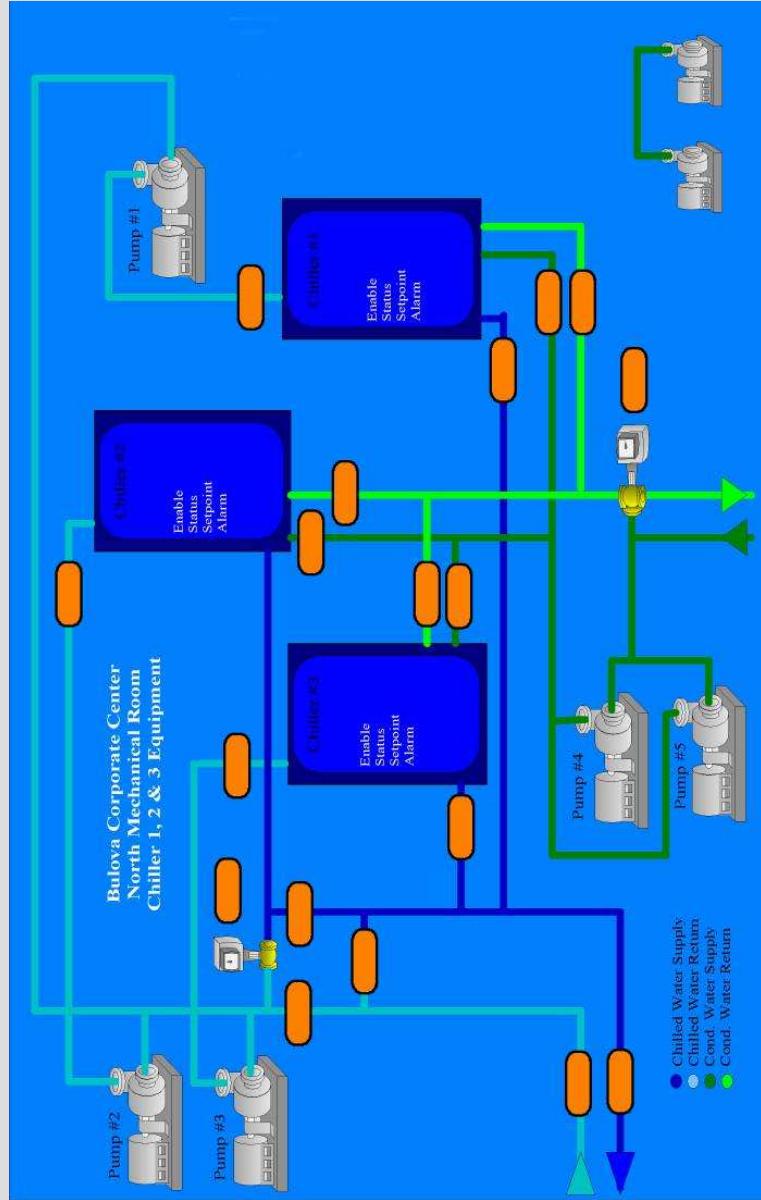


PROGRAMMABLE CHILLER OPTIMIZATION SYSTEM VIA “OPC” CONNECTION



ELEMCO BUILDING CONTROLS

Goals

- Bring my Plant up to speed
- Take advantage of enhanced technology
- Vendor independence
- Expandability
- Flexibility
- Control, Automation, Optimization, & Integration for Systems & Plant

Savings From Automation & Control

- A. Temperature Setback
- B. Optimum Start
- C. Scheduling
- D. Cycling
- E. Outside Air
- F. Demand Control

Savings From Integration & Optimization

- A. Building Configuration
- B. Control Strategy
- C. Local Utility Rates
- D. Weather tape Data
- E. Outside Air
- F. Demand Control

Total System Control

Start/Stop:

- A. Chillers
- B. Pumps
- C. Tower Fans

Open/Close:

- A. Water Valves
- B. Fresh Air Dampers

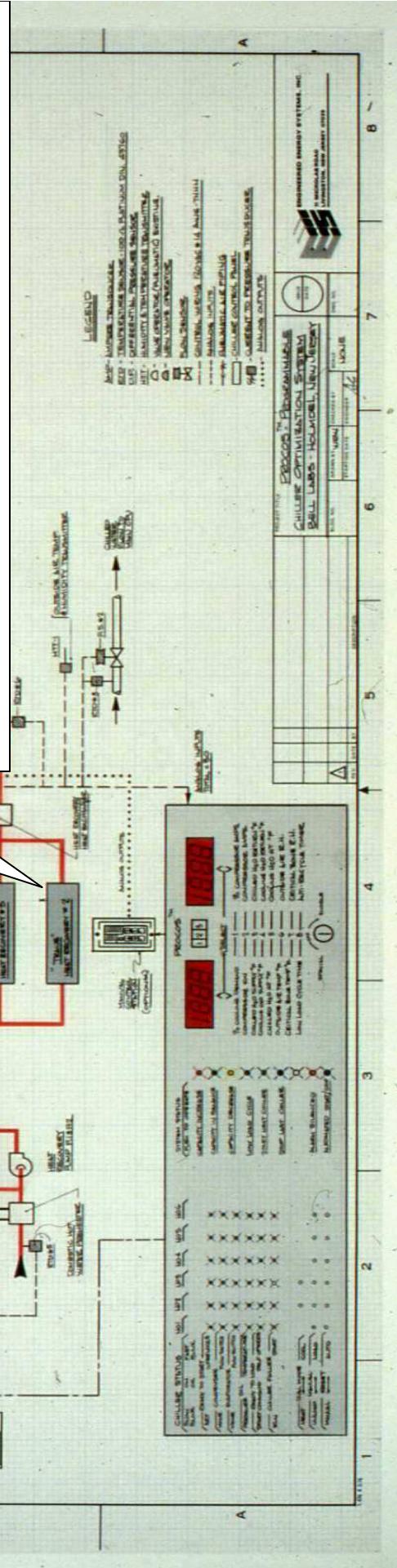


Feature: Start/stop Chillers

- Time of Day/Calendar
- Cooling Load Projections
- Distribution Fault Protection
- Low Load Cycle

Benefit: Save Energy & Maintenance Dollars By

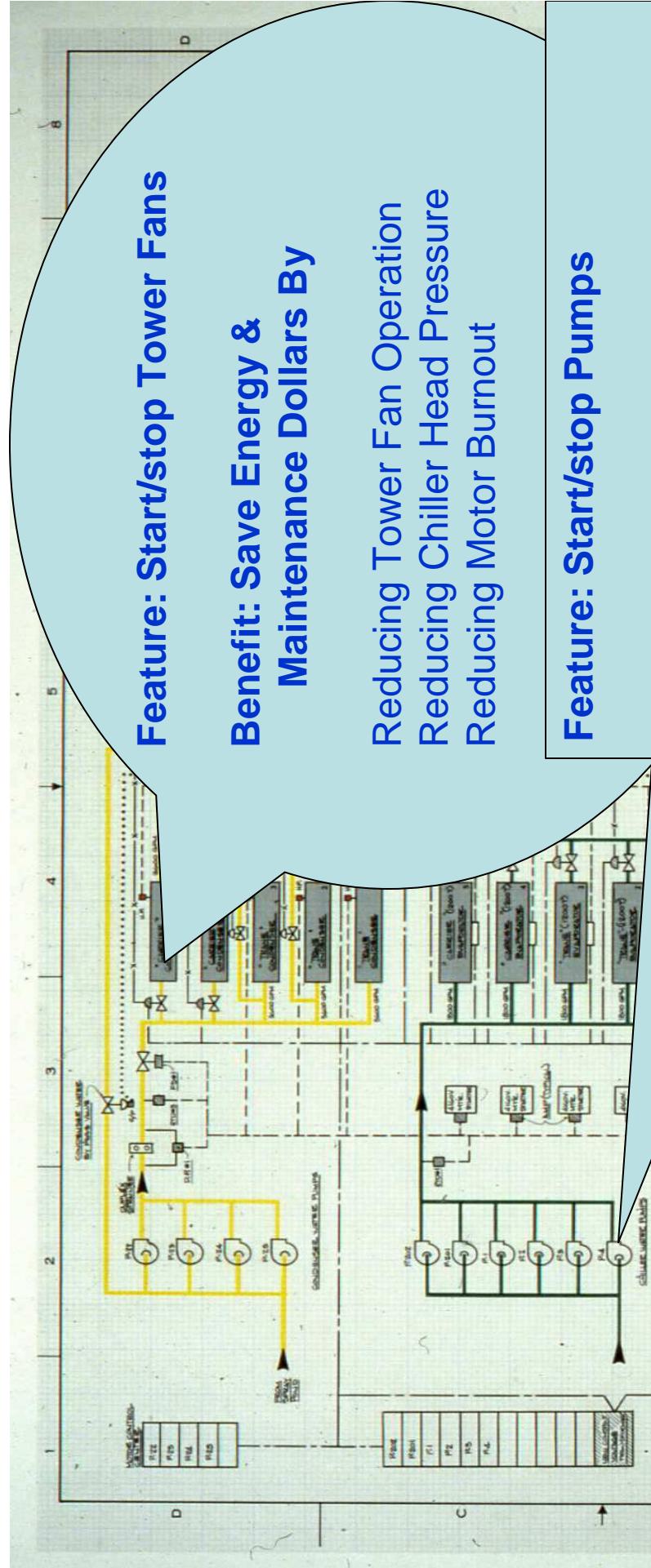
- Reducing System Run Time/Skipping Holidays
- Sliding Start/Stop
- Reducing Motor/Gear Train/Impeller Damage
- Eliminating Hot Gas Bypass



Feature: Start/stop Tower Fans

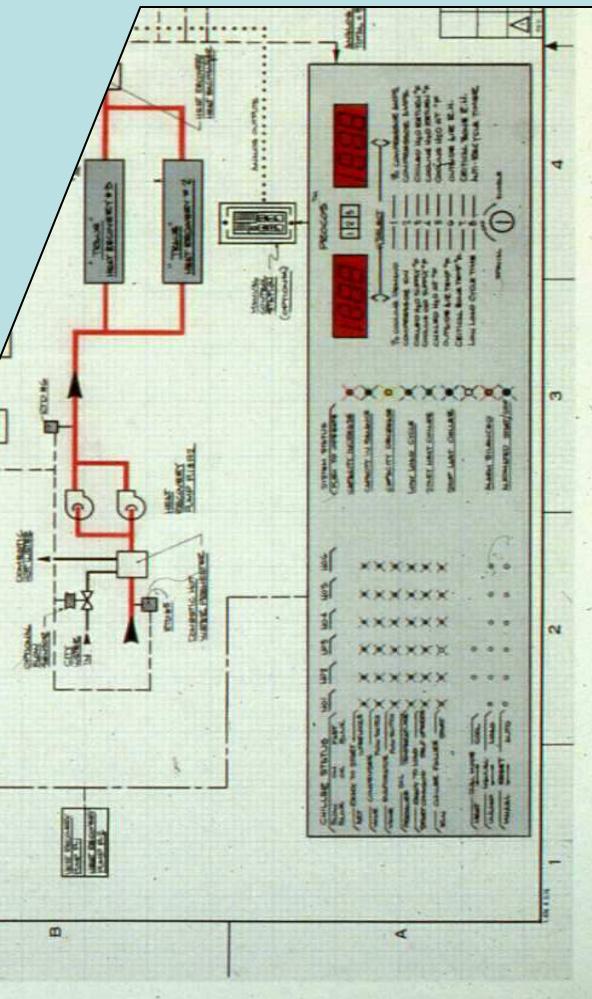
Benefit: Save Energy & Maintenance Dollars By

- Reducing Tower Fan Operation
- Reducing Chiller Head Pressure
- Reducing Motor Burnout



Feature: Start/stop Pumps

- Primary Chilled Water Pumps
- Secondary Chilled Water Pumps
- Condenser/Heat Recovery Water Pumps



Benefit: Save Energy & Maintenance Dollars By

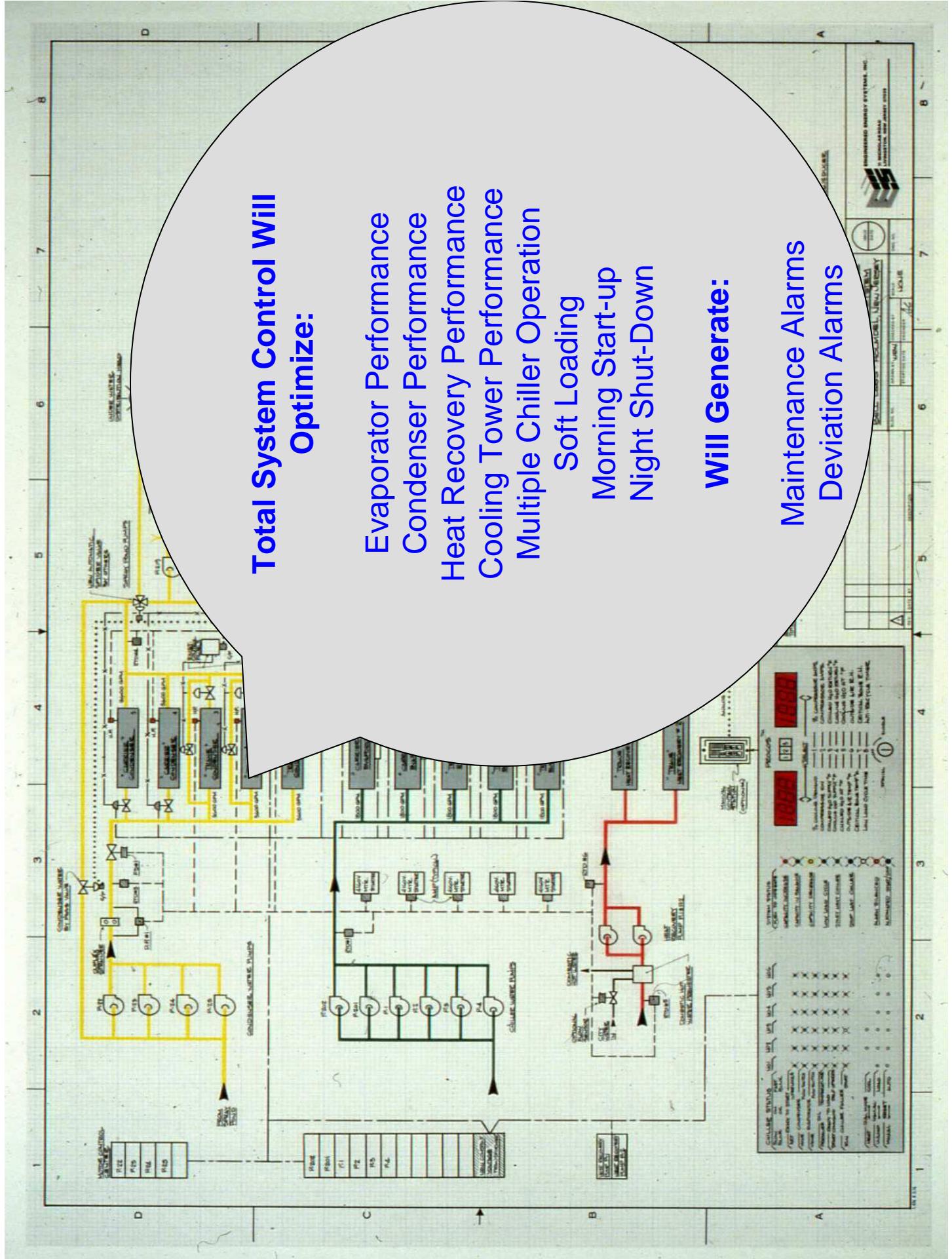
- Eliminating Needless Pump Operation
- Reducing System Downtime
- Reducing Motor Burnout

Total System Control Will Optimize:

Evaporator Performance
Condenser Performance
Heat Recovery Performance
Cooling Tower Performance
Multiple Chiller Operation
Soft Loading
Morning Start-up
Night Shut-Down

Will Generate:

Maintenance Alarms
Deviation Alarms



Feature: Optimized Condenser Performance Thru Solid State Head Pressure Sensors Automatic Purge Pump

Benefit: Save Energy & Maintenance Dollars By Reducing Compressor Lift Eliminating False Head Eliminating Compressor Surge

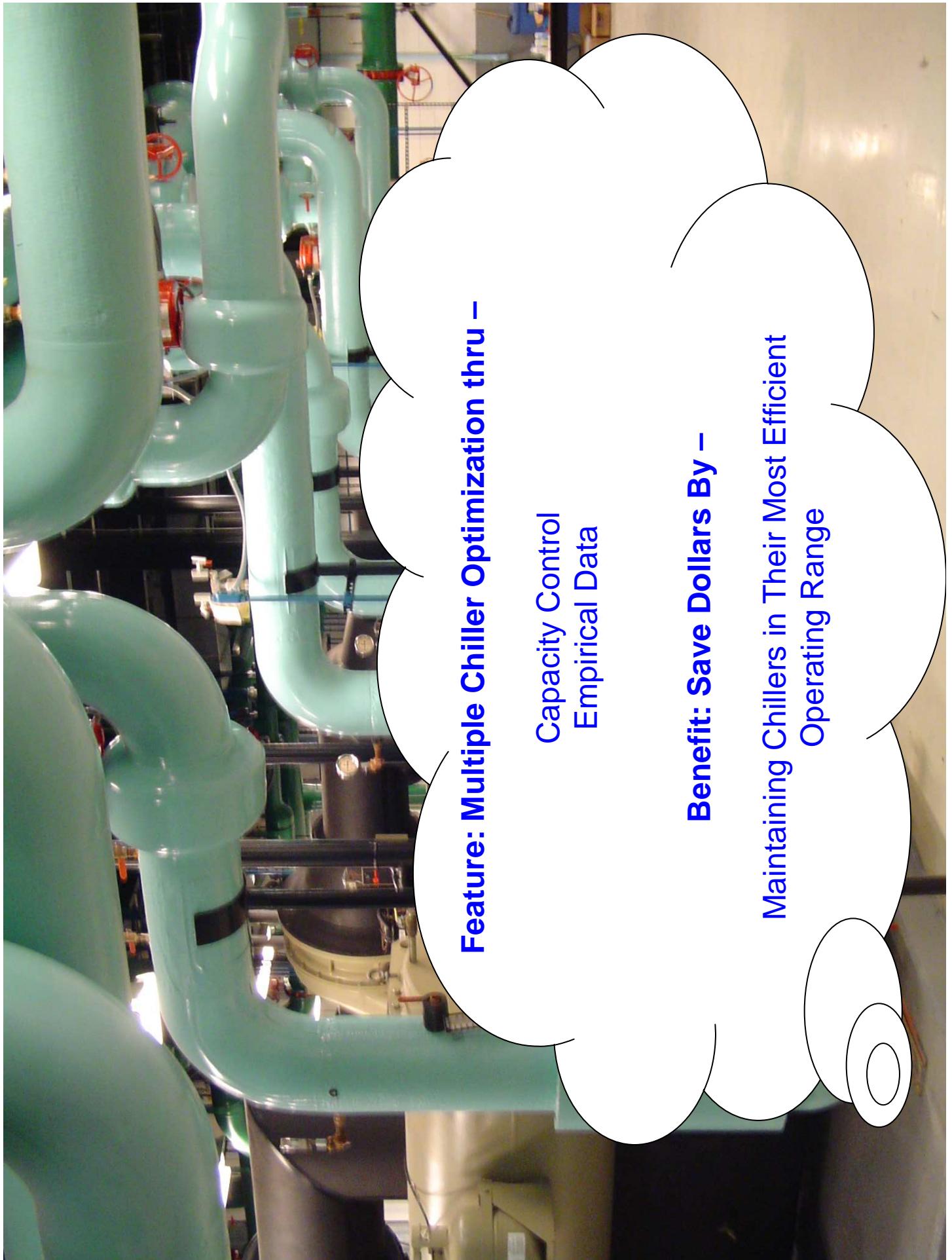
Feature: Tower Optimization Thru Head Pressure Control Computerized Control Algorithms

Benefit: Save Energy & Maintenance Dollars By Reducing Tower Fan Operation Reducing Water Usage Reducing Chemical Usage

Feature: Optimized Evaporator Performance Thru Capacity Control vs. Reset Closed Loop Feedback Multiple "PID" Loops

Benefit: Save Energy & Maintenance Dollars By 1% Loading Increments Direct Digital Control Eliminating Chiller Instability & Hunting Eliminating Proportional Offset Soft Loading





Feature: Multiple Chiller Optimization thru –

Capacity Control
Empirical Data

Benefit: Save Dollars By –

Maintaining Chillers in Their Most Efficient
Operating Range

Feature:

**Open Close Fresh Air Dampers
Thru –**

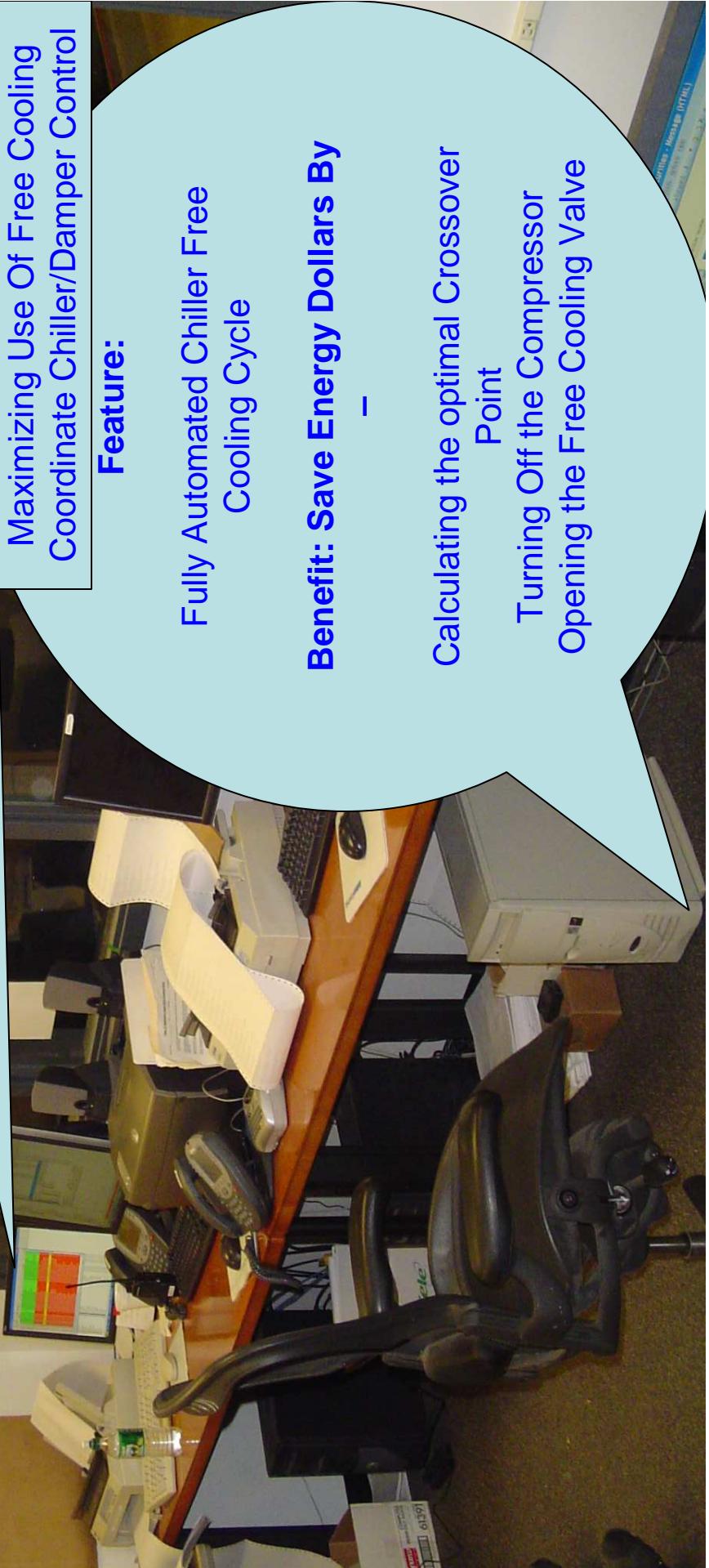
- True Enthalpy Comparisons
- Precise Temperature Measurement
- Precise Humidity Measurement

Benefit: Save Energy Dollars By

- Maximizing Use Of Free Cooling
- Coordinate Chiller/Damper Control

Benefit: Save Energy Dollars By

- Fully Automated Chiller Free Cooling Cycle
- Calculating the optimal Crossover Point
- Turning Off the Compressor
- Opening the Free Cooling Valve



Feature: Chiller Diagnostics Thru –

Statistical Trend Analysis
Efficiency Mapping

Benefit: Save Energy & Maintenance Dollars By –

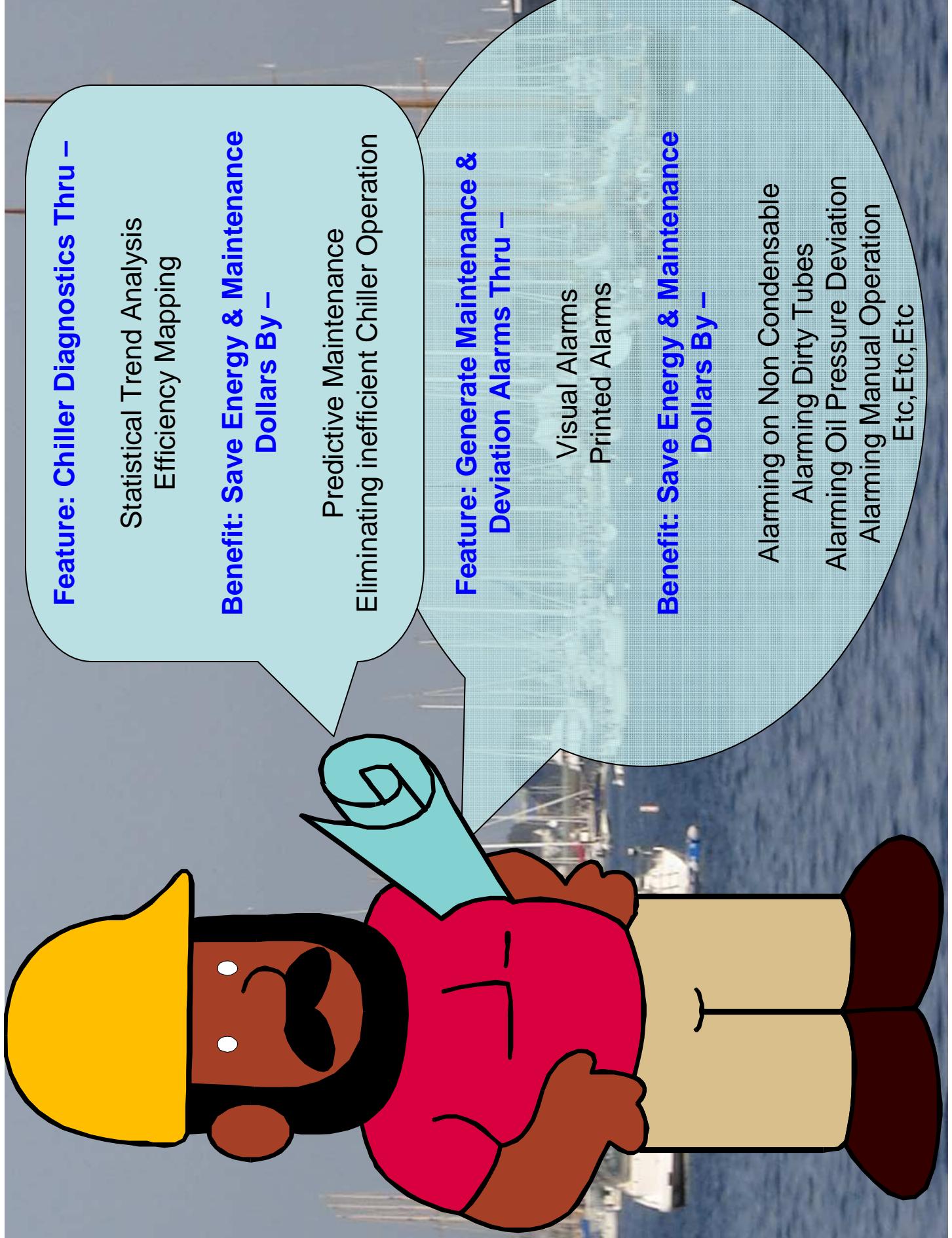
Predictive Maintenance
Eliminating inefficient Chiller Operation

Feature: Generate Maintenance & Deviation Alarms Thru –

Visual Alarms
Printed Alarms

Benefit: Save Energy & Maintenance Dollars By –

Alarming on Non Condensable
Alarming Dirty Tubes
Alarming Oil Pressure Deviation
Alarming Manual Operation
Etc,Etc,Etc



Now Let's Look At An Industry Situation

With Hardware And Software i.e.

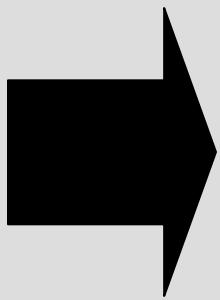
Building Automation Manufacturers

HONEYWELL

ANDOVER

SIEMENS

See The Difference



TELETROL

JOHNSON

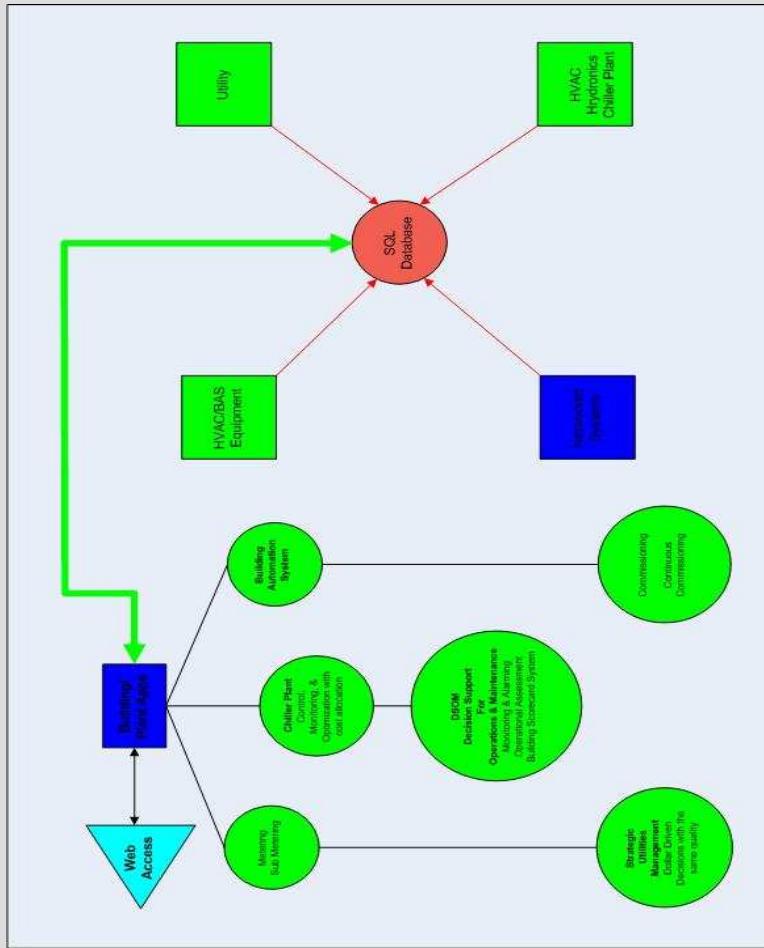
BUILDING AUTOMATION SYSTEM (BAS)

- Obsolete
- High Maintenance
- Zero Confidence
- Glued Together
- Only a Few are in Control



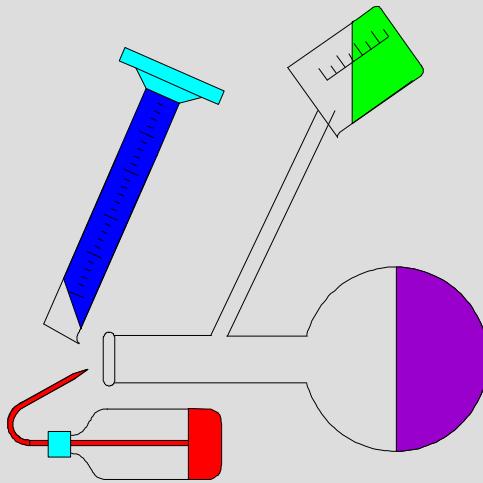
OPC Connection Versus DDC Controllers

- Life Cycle
- Resolution
- Memory Error Checking
- Programmability
- Scan Rate
- I/O Update Time
- Open Protocol



PROCESS INSTRUMENTATION

- Life cycle cost
- Accuracy
- Repeatability
- Why use the good stuff ?



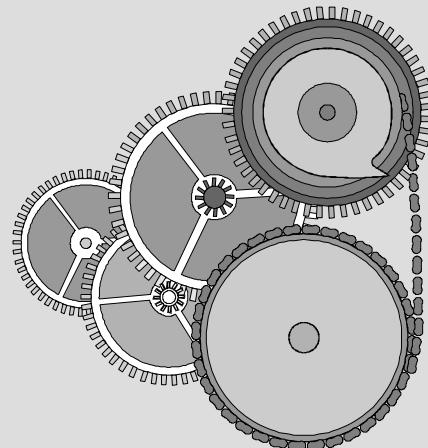
STANDARD SOFTWARE

- “Not canned”
- Fits the application exactly
- Includes comments from the guru
- Changes are easy , quick , & cheap



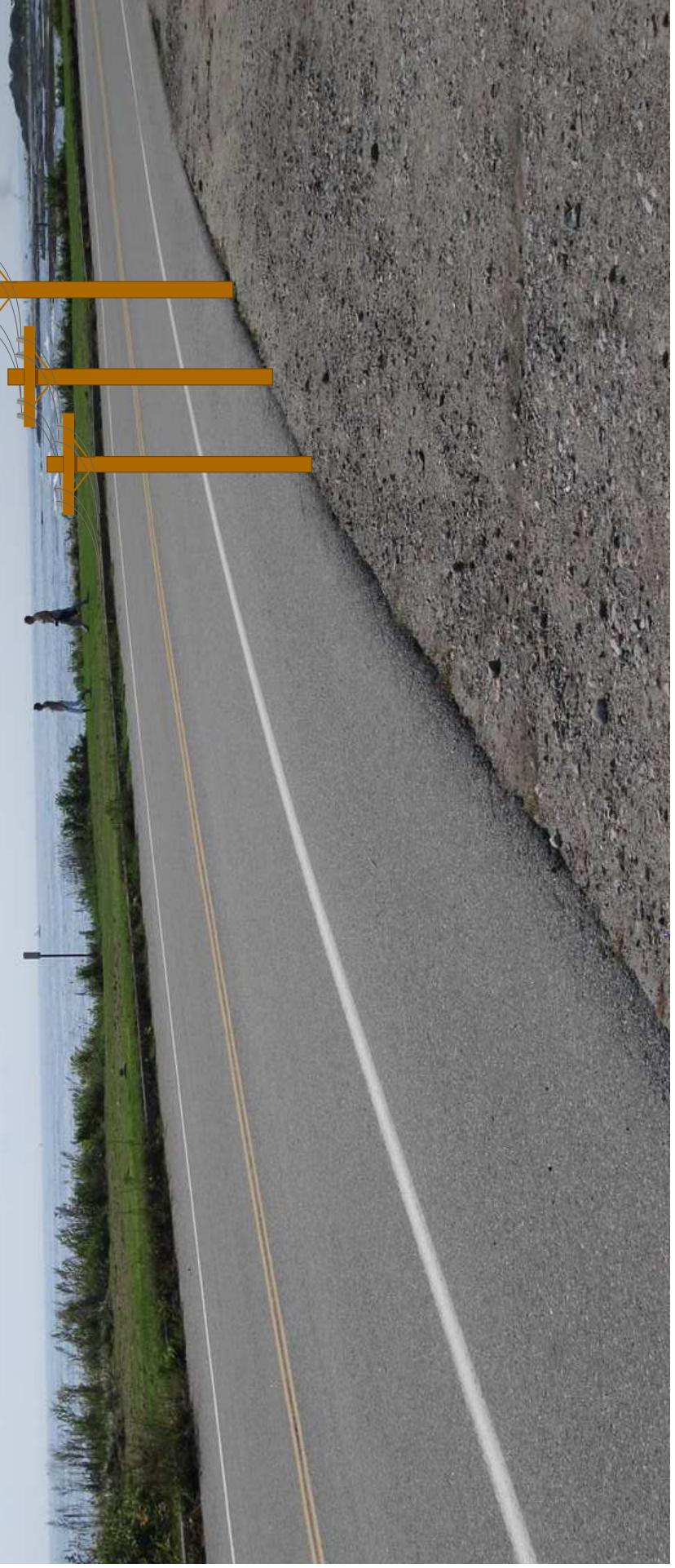
PROCESS CONTROL

- PID Loop
- Range limits
- Set point Ranges
- Buffering
- Scaling
- Cascading
- Anti-wind-up



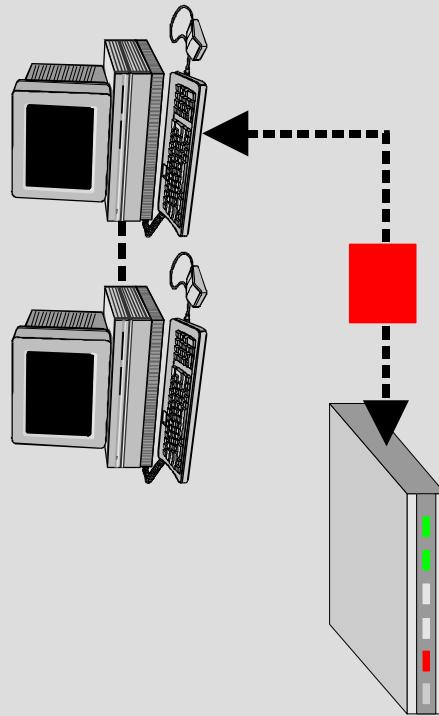
COMMUNICATIONS

- In the plant
- Off Site
- Internet
- Next wave ?



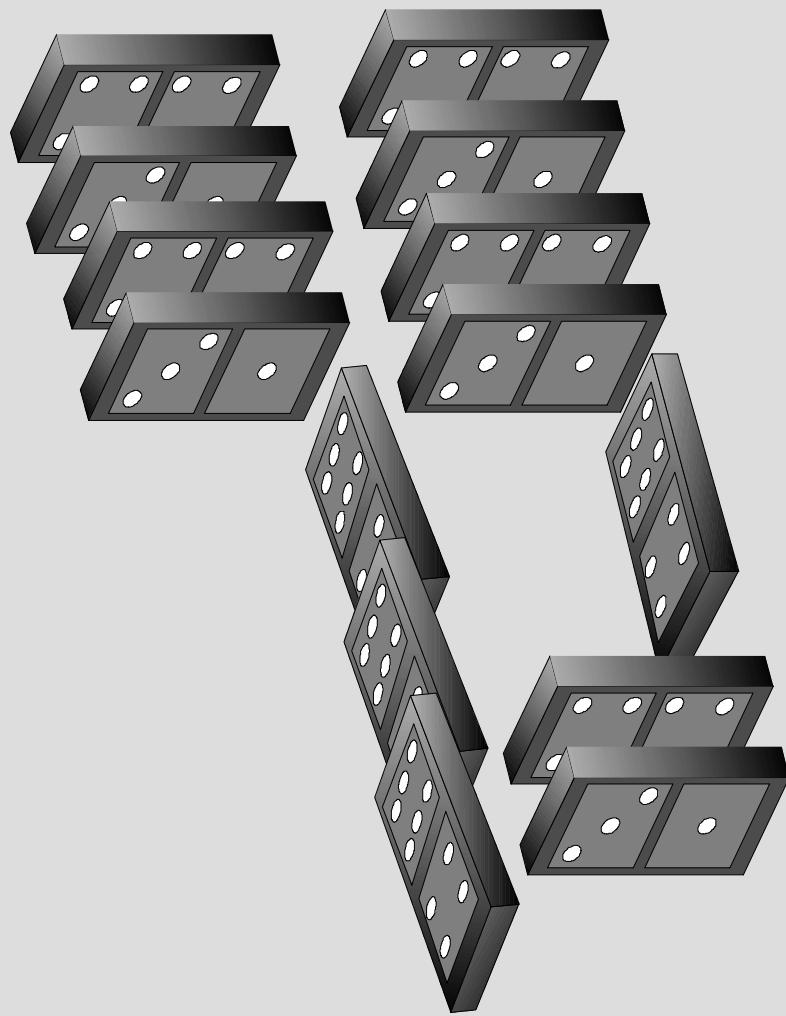
REMOTE ACCESS

- Off site monitoring
- Early Warning
- Disaster Recovery
- Employee Responsibility



EVASIVE ACTION

- Mechanical failures
- Back-up modes
- Alerts & Alarms
- Continue to march
- No Downtime



PRETTY PICTURES

- Operator friendly
- Secure
- Remote manual Accountability
- Custom Reports
- Stand Alone
- Sexy



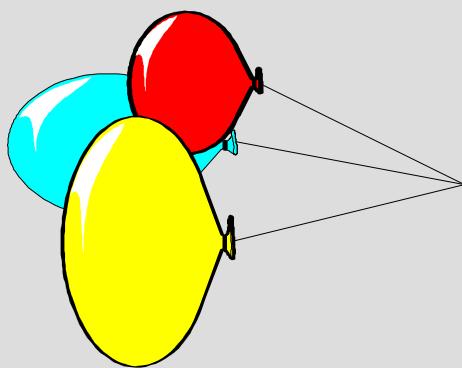
FLEXIBLE

- Communications
- Drivers
- I/O
- Strategies
- New Technology
- Building Use



EXPANDABLE

- Add-ons
- Another Chiller
- Another Building
- Another System
- Another location
- A new technology



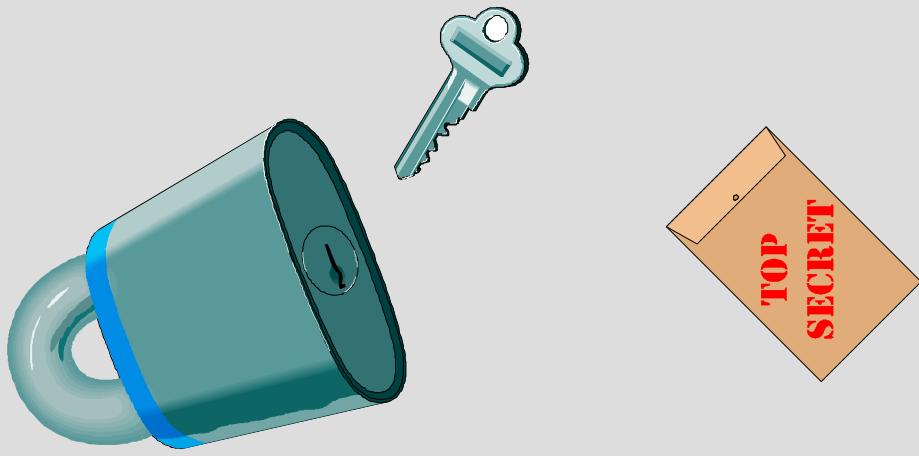
COMMERCIAL ISSUES

- PROPRIETARY
- VENDOR INDEPENDENCE
- SERVICE CONTRACTS
- PAYBACK
- FINANCIAL JUSTIFICATION



PROPRIETARY

- Source Code
- Protocol
- Hardware
- Software
- Algorithms
- Strategies



SOURCE
CODE ?



SERVICE CONTRACT

- The Game
- Do not pay / Do not collect
- In house ability
- Remote Access
- 24 Hour Monitor
- We have an enhancement department



MARRIED FOR LIFE

- Hardware
- Software
- Service
- Pre-nuptial
- Non-disclosure solution



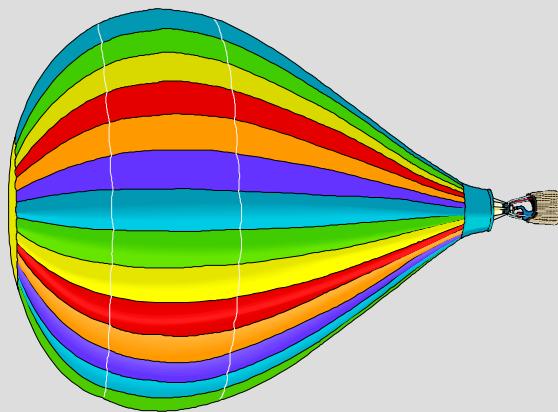
BacNet

- ASHRAE Standard
- MAY become significant ?
- Great for End Users
- Driver being written
- Use your influence by specifying this standard

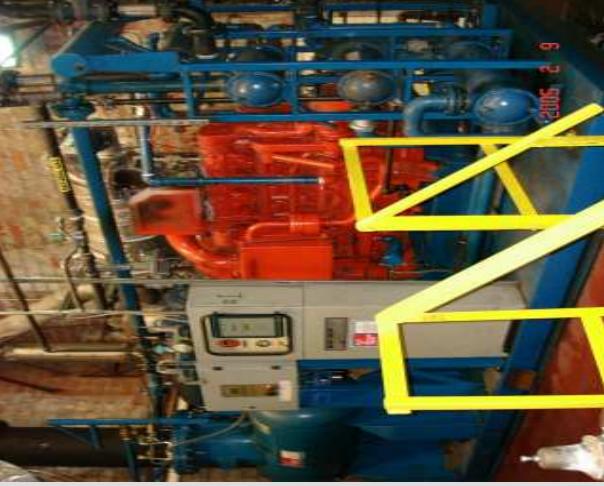


VENDOR INDEPENDENCE

- What if ?
- Hardware support ?
- Software support ?
- Service support ?



APPLICATIONS

- Energy Saving Opportunities
 - Solutions for Building Problems
 - New Strategies
 - Fail Safe Operation
- 
- 
- 
-
- 

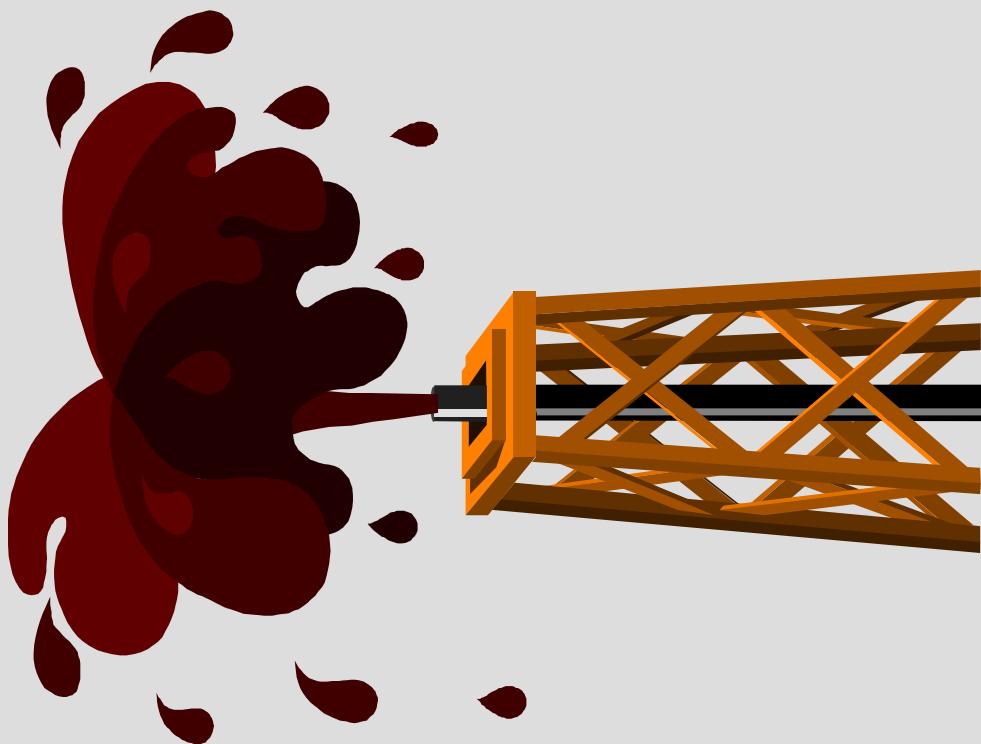
METERING

- KWHR - USE
- KW - DEMAND
- BTUs
- SUB- METERING
- COST ALLOCATION



DEMAND CONTROL

- Your Utility Bill
- Time of Day
- Peak Avoidance
- Weekday Versus Weekend
- Day Light Savings



- Thank you
- Call for a FREE Consultation
- Elemco Building Controls, Inc.
- 908-281-2201