



# **Evolution of PI in an Expanding Utility's Strategy**

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**KeySpan**

# About Us

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# KeySpan is the largest generator in New York State



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# Our “Fleet” consists of:

- 4,250 MW Steam (14 Units)
- 1,950 MW Internal Combustion (61 Units )
- 250 MW Combined Cycle (1 Unit )
- 160 MW LM 6000 (4 Units )



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# ...located from New York City to Montauk Point



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# National Grid/KeySpan Acquisition

- Acquisition announced in February 2006
- Makes us the Third Largest Utility in the U.S.
- Combined Company Snapshot
  - 18,000 employees
  - 4.4 million electric customers
  - 3.4 million gas customers
- Total deal value \$11.8 billion

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# Corporate Strategy

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# Our Corporate Strategy is simple...

- Continue to maintain high levels of performance
- Keep costs down
- Maintain reliability
- Spend budget dollars where we will get the best payback.

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# How does PI help us with our Corporate Strategy?

It keeps us at the Top of Our Game.

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# PI Drives:

- Our Performance Analysis Engine
- Our E-notification System
- Distributed Control System (DCS) Historical Database
- Our Independent System Operator (ISO) Interface to the Control Rooms
- Our Performance Analysis Historical Database
- Monthly Heat Rate Packages

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# PI's role is Mission Critical to meeting KeySpan's Corporate Strategy.

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# Business Challenges

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# Our working environment

- Increased competition
- Higher O&M costs
- Higher fuel costs
- Work force reductions
- Already running more efficiently than we have ever run before
- More stringent Ecological standards
- Paperwork and documentation requirements increasing everyday

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# How did we take.....

- Over 80 units that are run like individual feudal kingdoms
- Over 30 different OEM control and information systems
- 2 different Company cultures
- A hodgepodge of computer hardware
- A group of Operators that really don't think computers are ever going to really “catch-on”

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**.....and craft a solid foundation that would meet our current and future needs.**

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# Answer =

**PI Database**  
**PI ProcessBook**  
**PI DataLink**  
**PI DCS Interface**  
**PI API**  
**PI Training**  
**PI to PI Interface**

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# Solution Evolution

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# Prior to 1995

LAN based system using the Intellution Product (real-time operational data and calculations for Control Room Operators)

## Limitations:

- Screen development complex
- Calculations cumbersome
- LAN based (no off site access)



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# 1995-1997

Introduced WAN based communication using the Intellution Product.

Limitations:

- WAN access to historical data poor
- Calculations cumbersome



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# 1997-1998

During the Port Jefferson Unit #3 Distributed Control System(DCS) upgrade to the ABB “Advent 300”, we installed ABB’s “Optimax” (Performance Calculation Engine). **PI** was the Database Core of the Performance Engine, providing direct real-time communication to the Distributed Control System and superior WAN access to the historical data.

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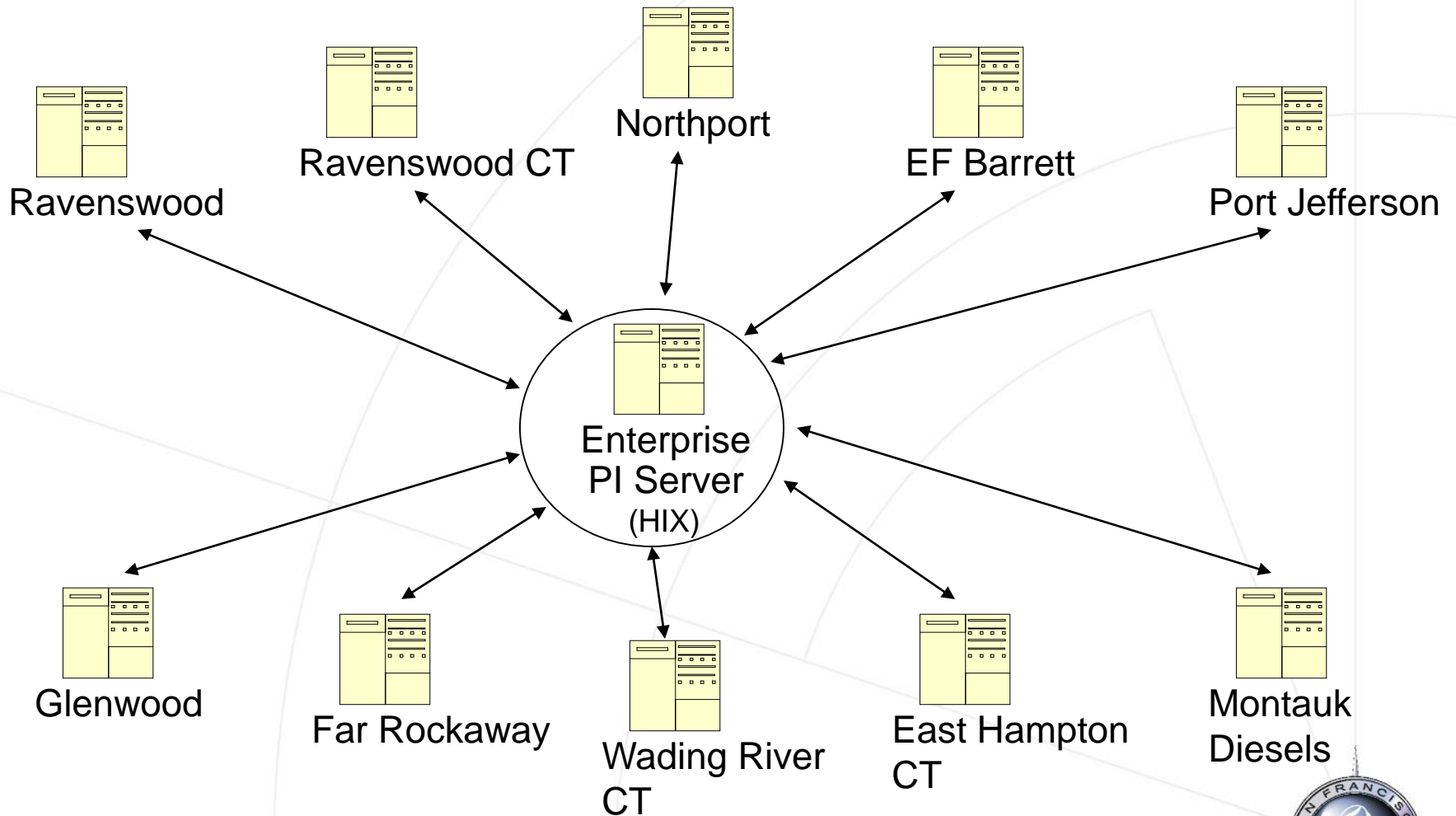
# 1998-2000

- Established **PI** as our Departmental Performance Database and DCS Interface Standard.
- Upgraded all existing Server hardware, Operating System, and Application Software throughout the Enterprise.
- Installed **PI** Servers at all Plants and an Enterprise Server at our Headquarters.

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# PI Server Infrastructure



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# 2000 - 2003

- Expanded Performance Improvement Team by 25% while the rest of the company reduced personnel by 15%.
- Trained new Team members
- Began “in-house” Customer **PI Process Book** training program.

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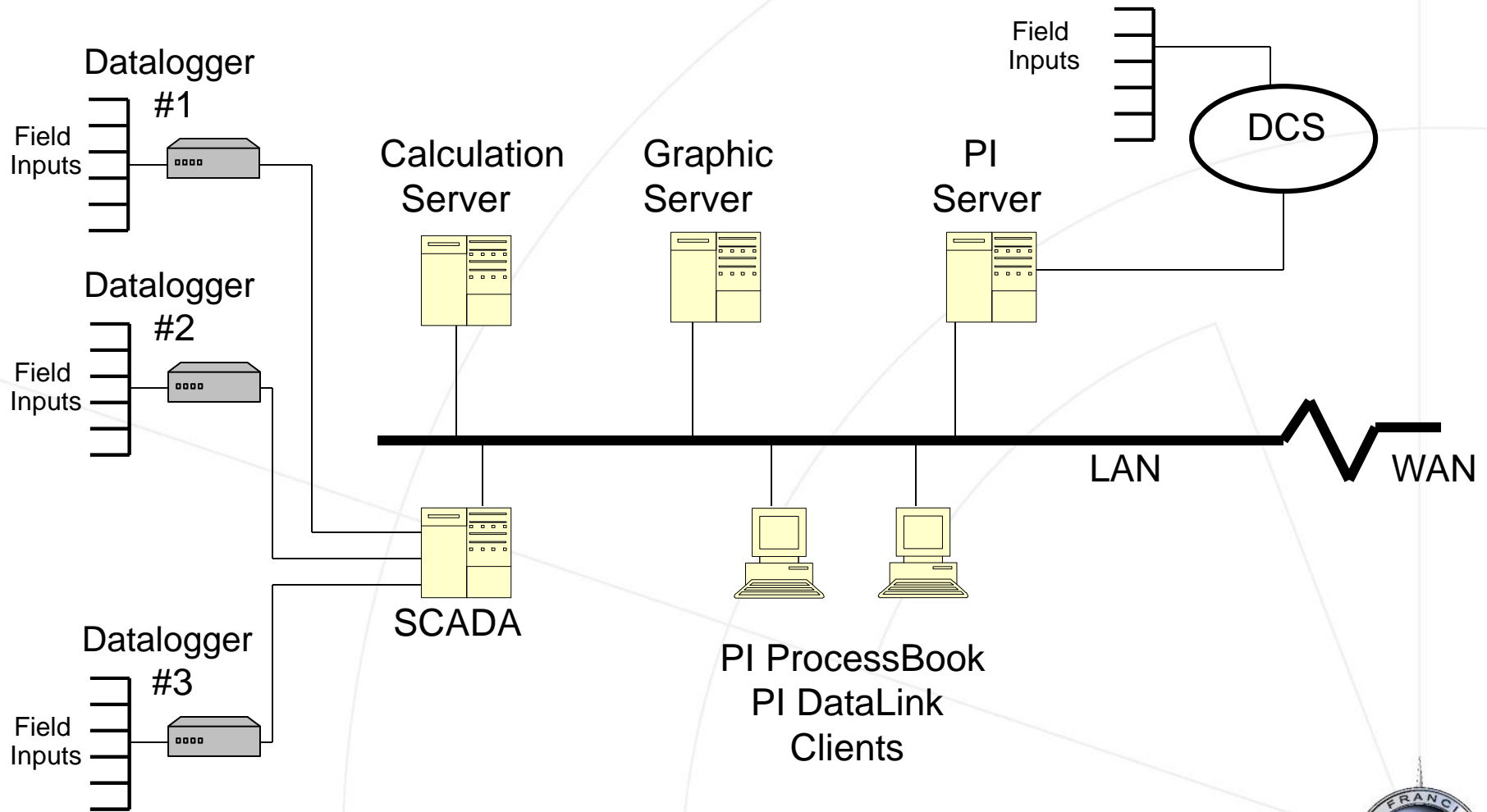
# 2003 - Present

- Implemented the “Performance Assessment Center” (PAC) powered by **PI ProcessBook**.
- Built **PI ProcessBook** Performance Analysis Toolbox.
- Established Standards for **PI ProcessBook** Control Room Base Point Load Interface
- Established Standards for **PI DataLink** Heat Rate Packages.

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# Standard Architecture



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# Our Successes

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# Heat Rate Savings

**\$6.7 Million**

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# Independent System Operator (ISO) Regulation Penalty Disputes

**\$2.5 Million**

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# Independent System Operator (ISO) DMNC Testing

\$250,000

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# Vibration Operational Analysis

\$750,000

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# Our Tool Box

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# The “PAC”

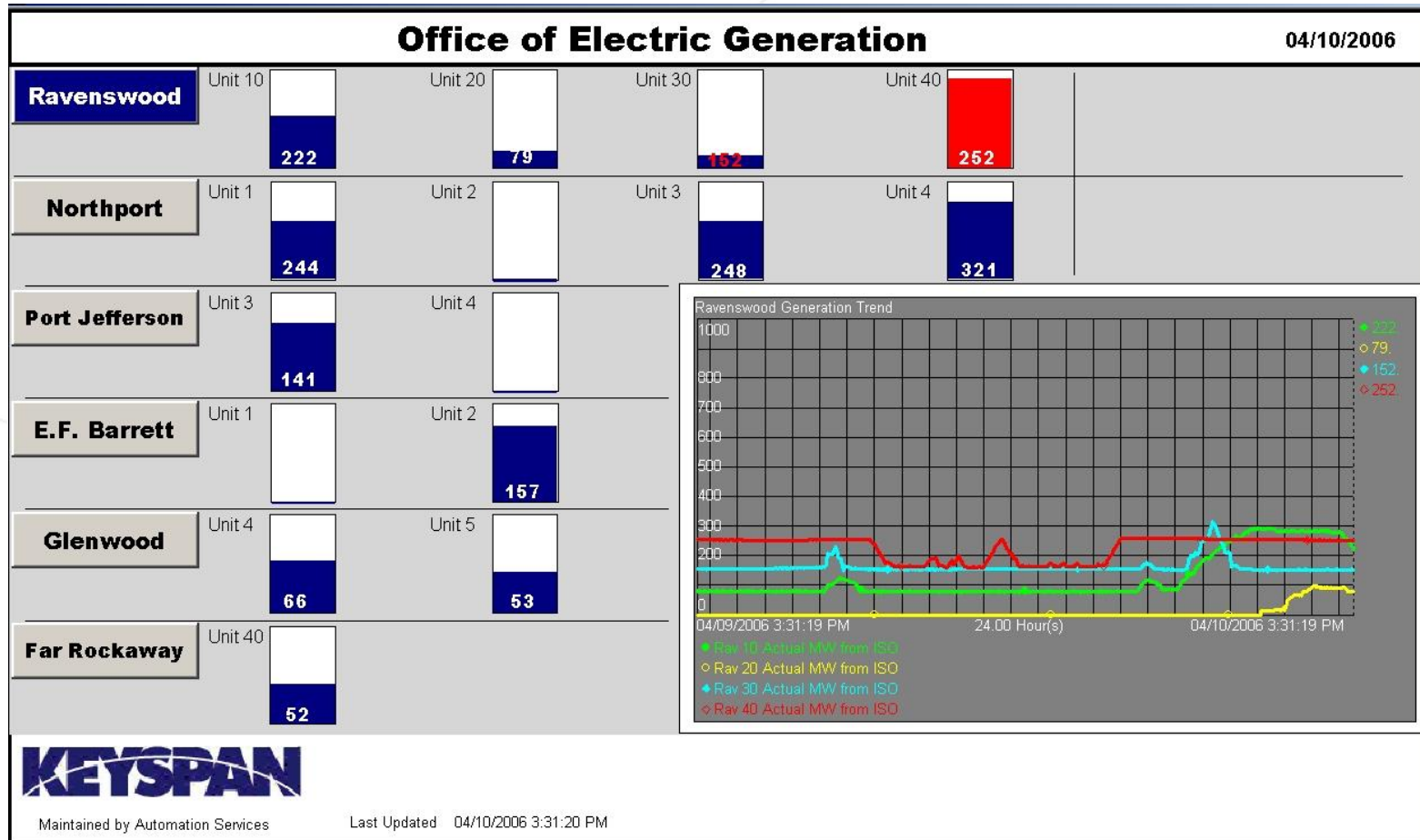


**Performance Assessment Center**

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# Level 1 – “PAC” Fleet View



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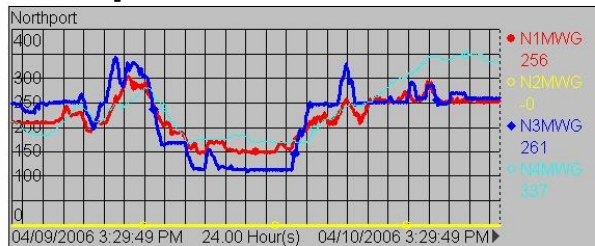


# Level 1 – Fleet Trend Summary

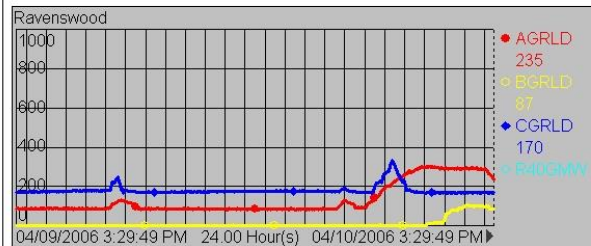
## Unit Online/Offline Trends

Close Screen

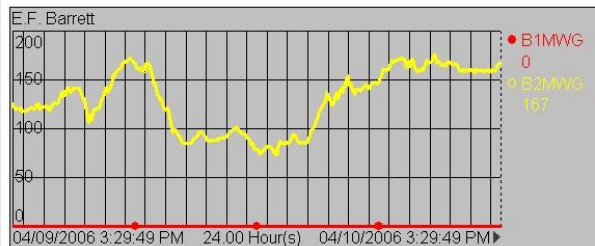
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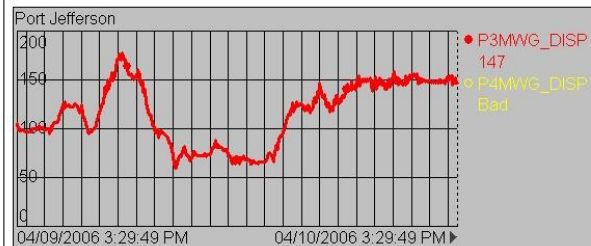
### Ravenswood



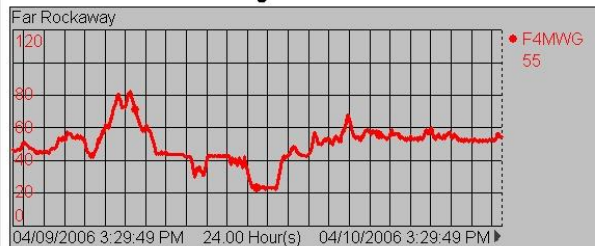
### E.F. Barrett



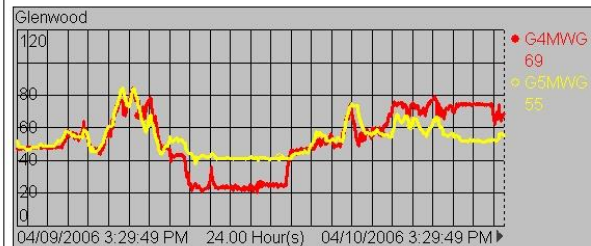
### Port Jefferson



### Far Rockaway



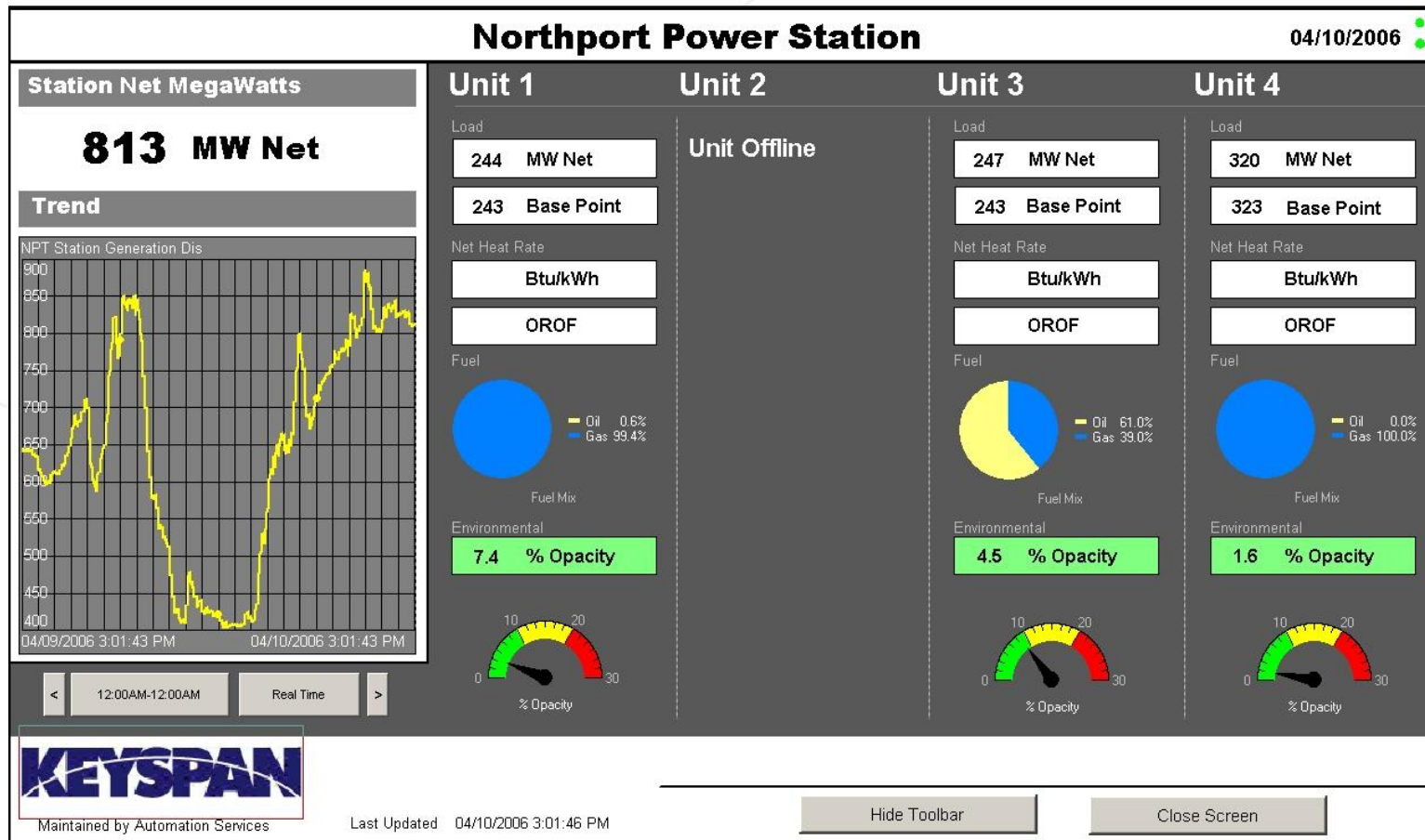
### Glenwood



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# Level 2 – Station View

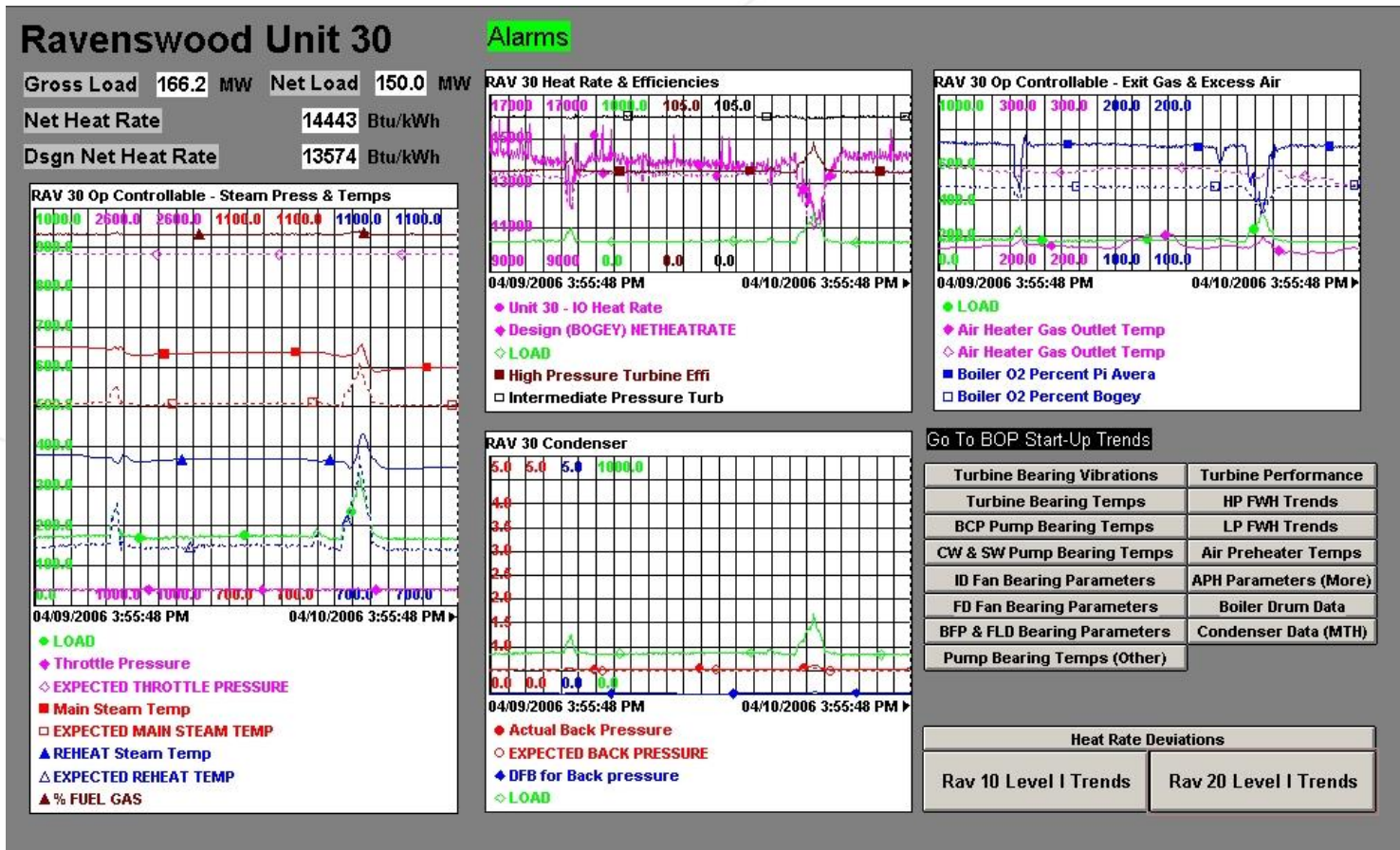


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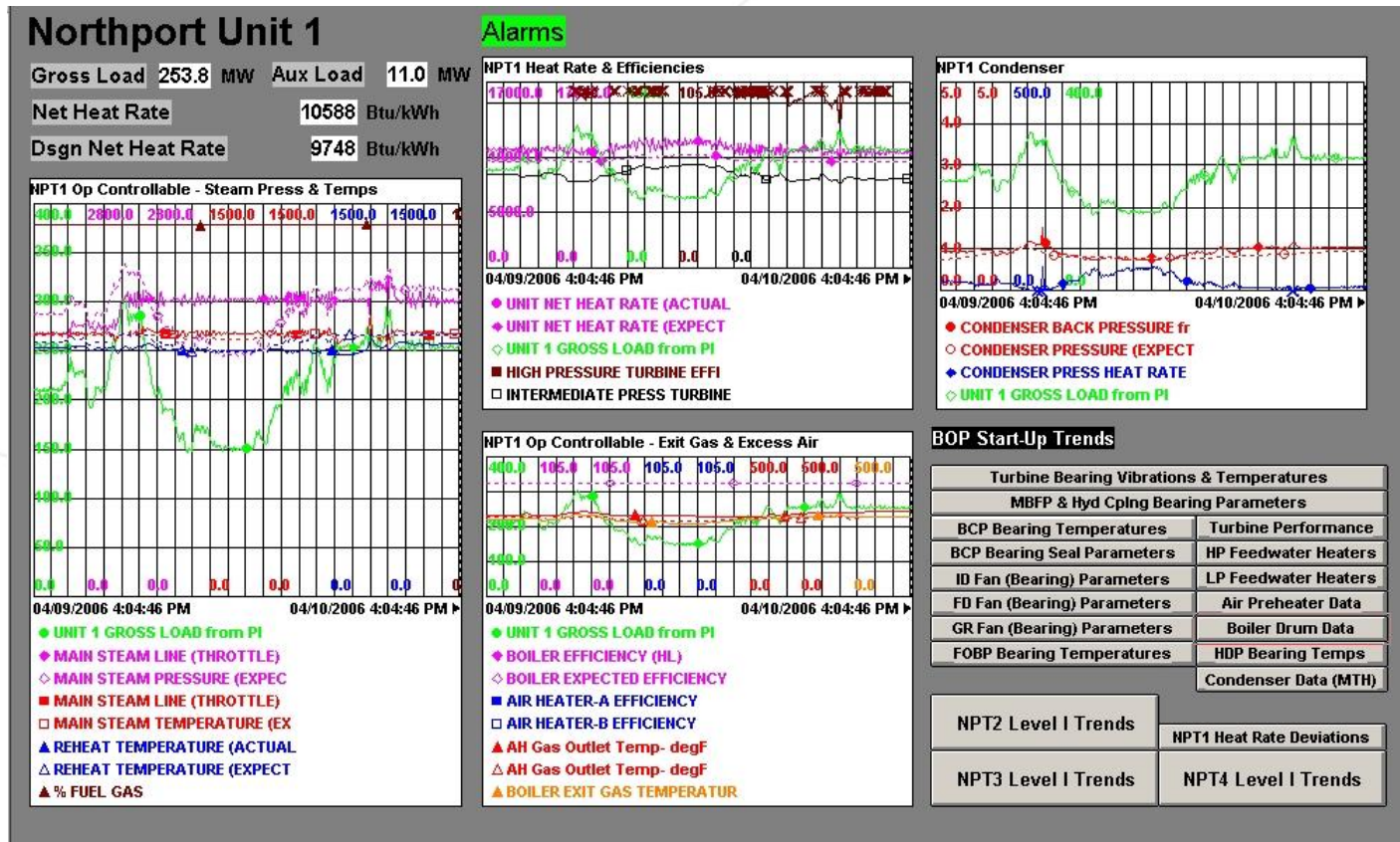
# Level 3 – Unit View (Summary)



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# Level 3 – Unit View (Performance)

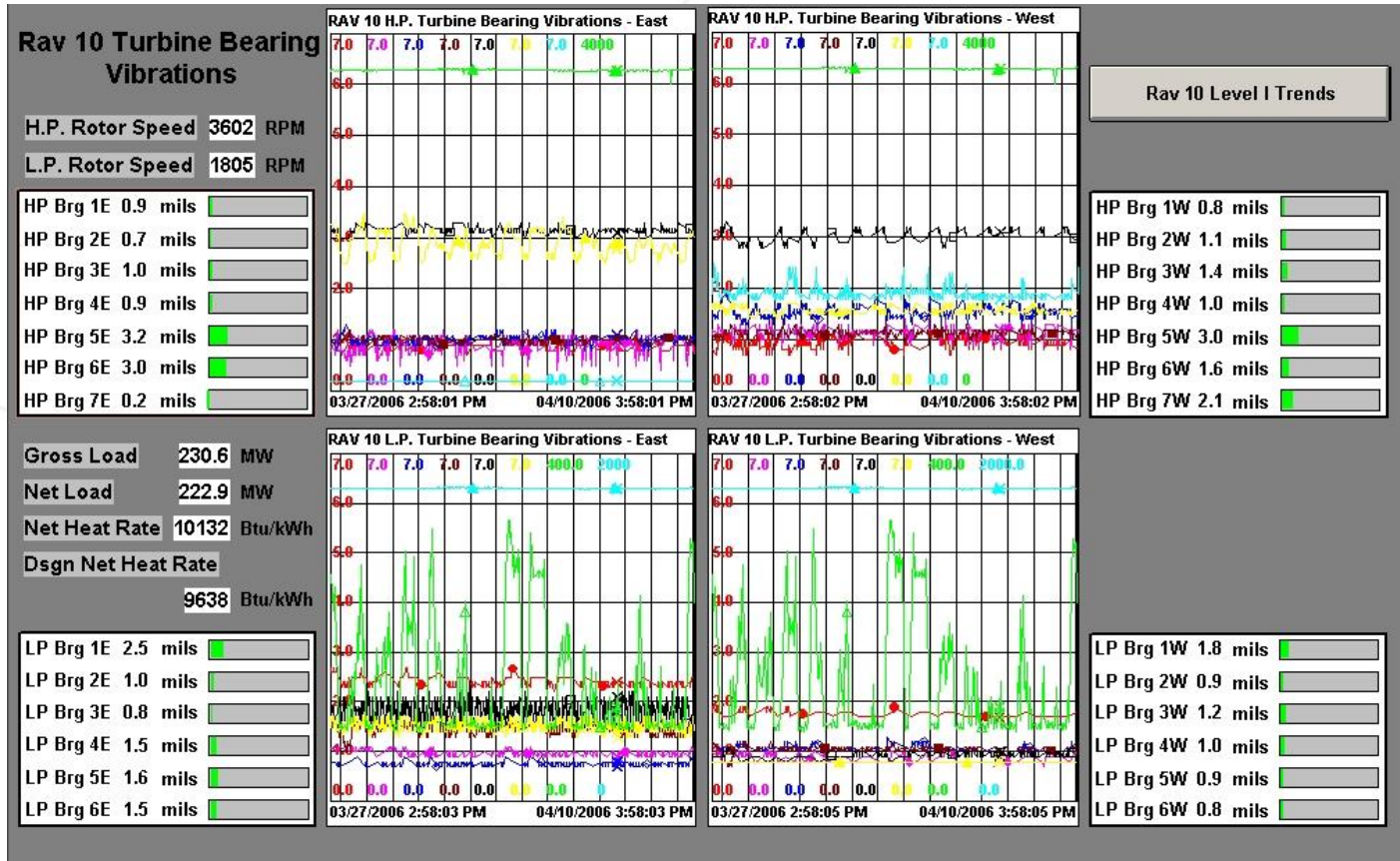


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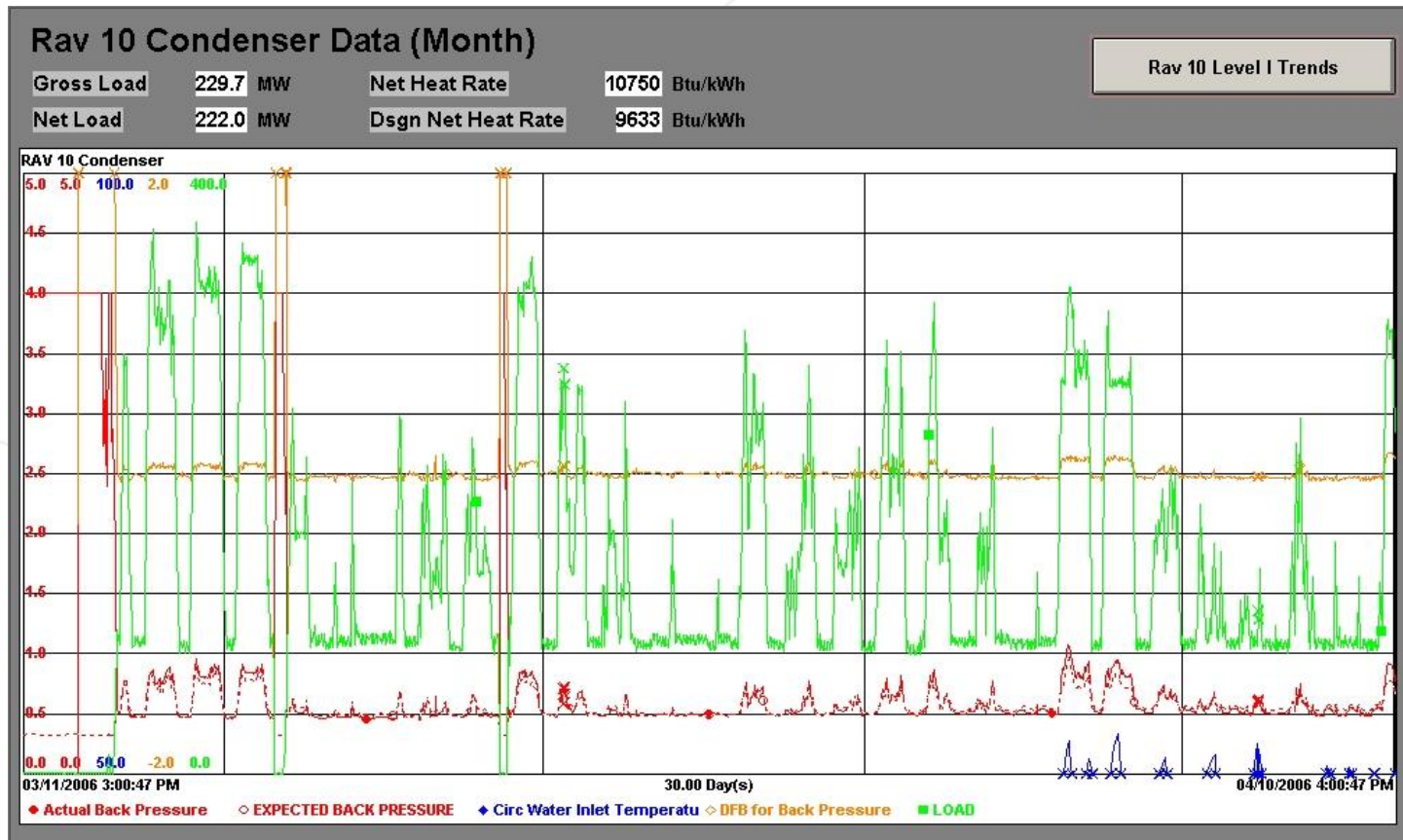
# Level 3 – Unit View (Vibration)



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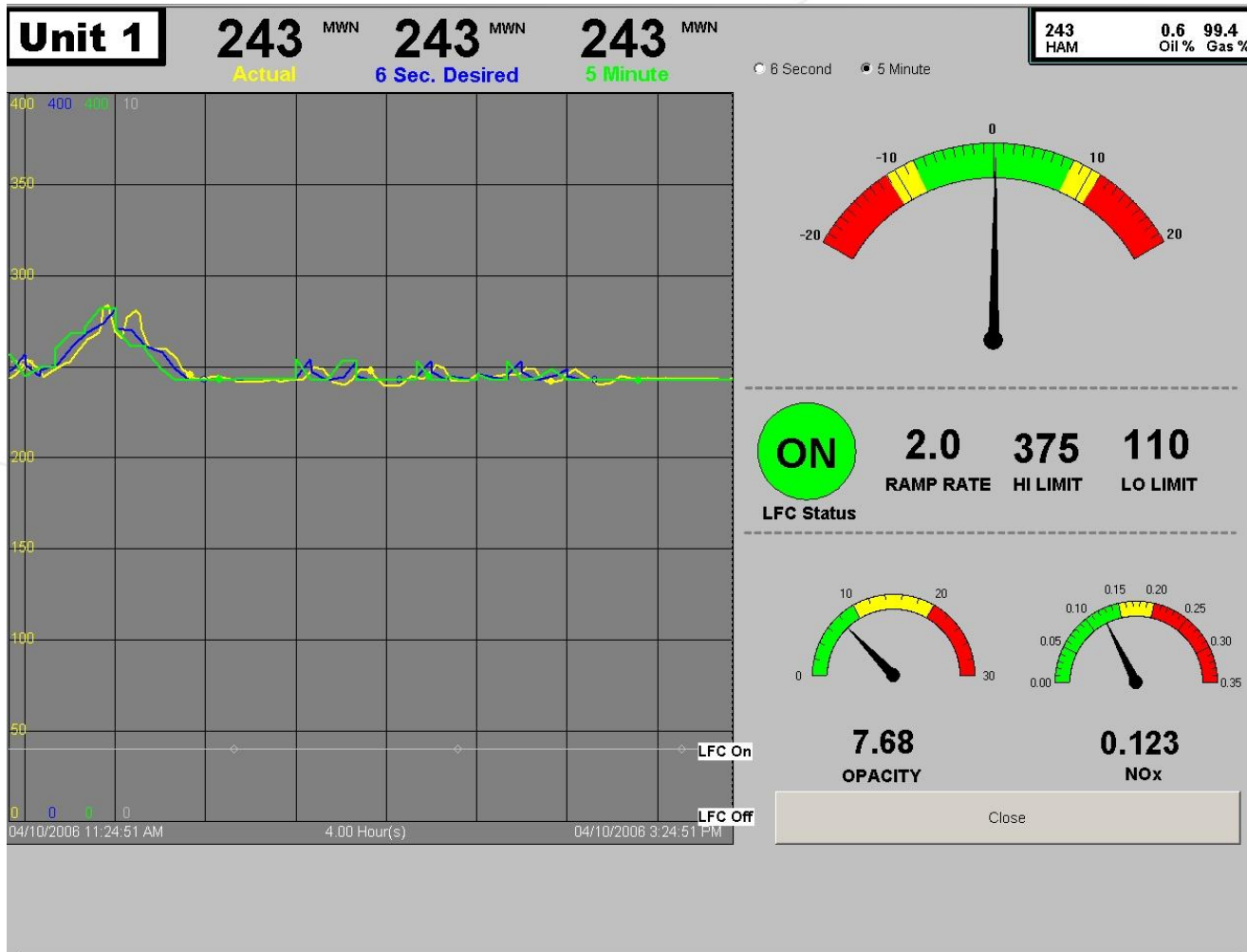
# Level 3 – Unit View (Performance)



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# Level 3 – Unit View (ISO Base Points)

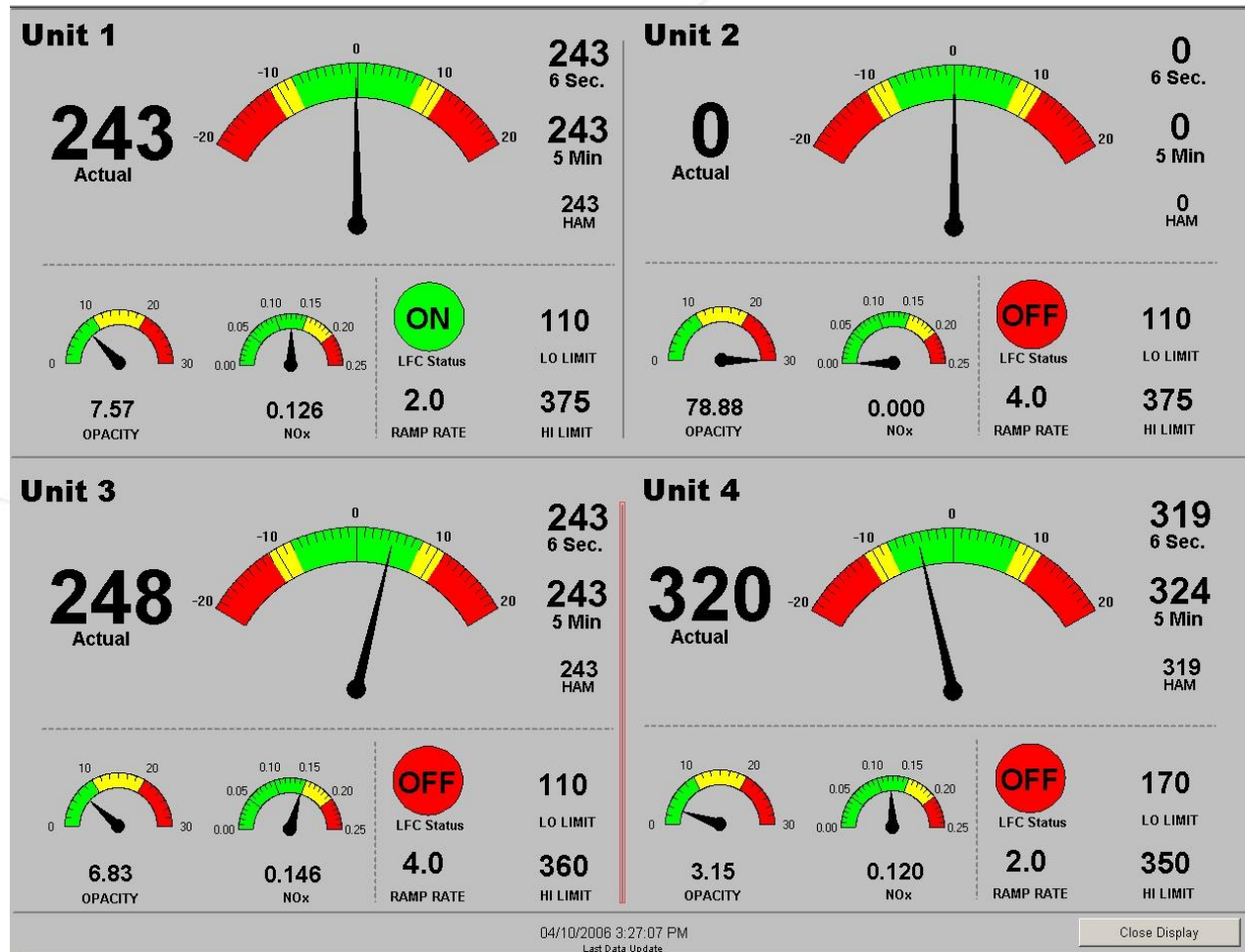


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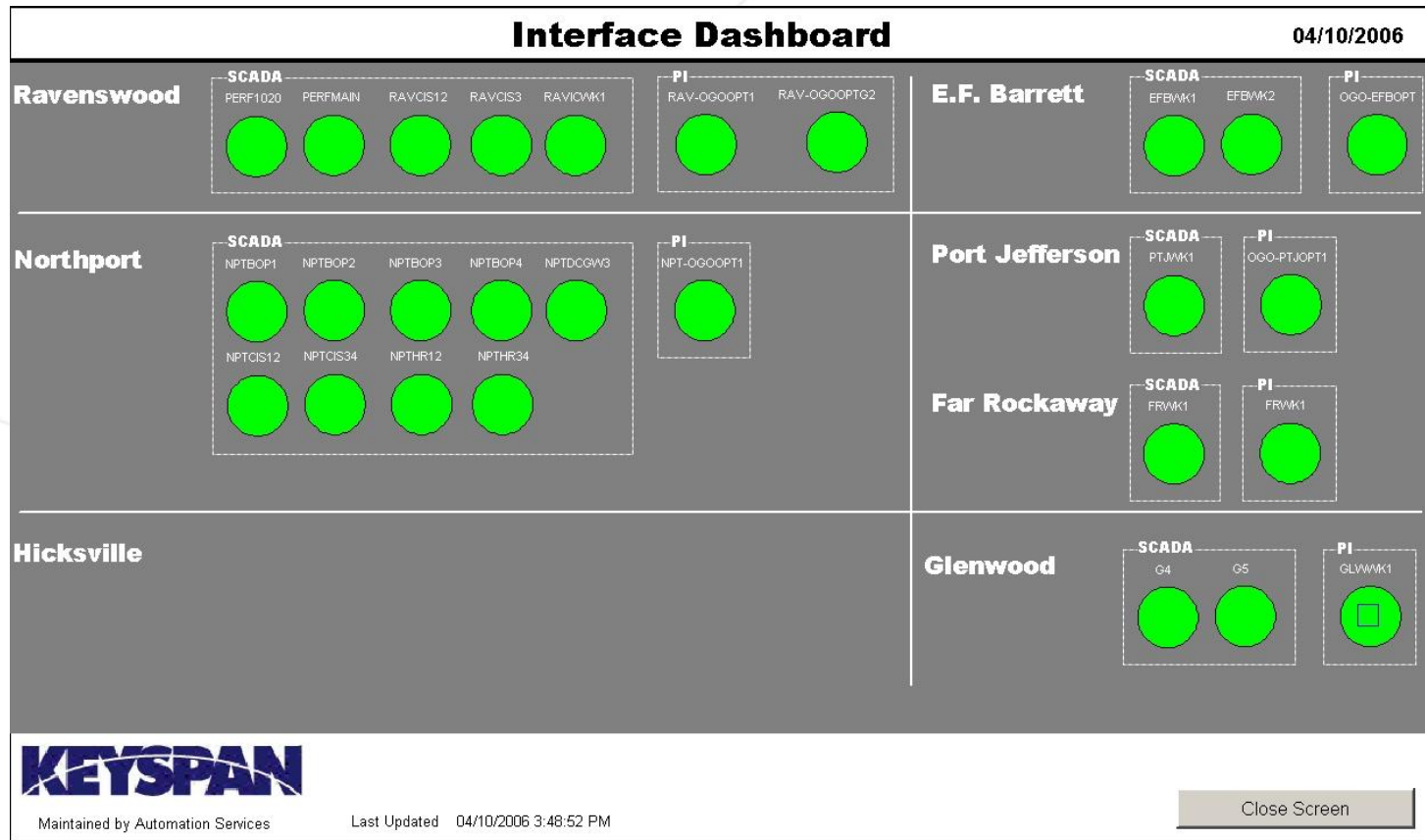
# Level 3 – Unit View (ISO Base Points)



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# Level 4 – System Diagnostics (Fleet Interface Summary)



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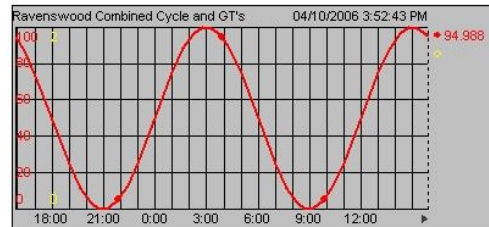
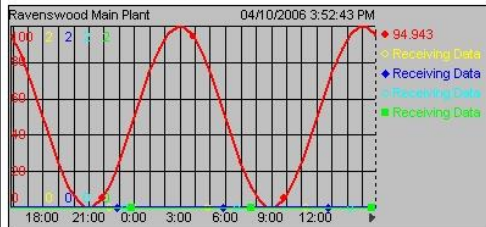


# Level 4 – System Diagnostics (Fleet Interface Trends)

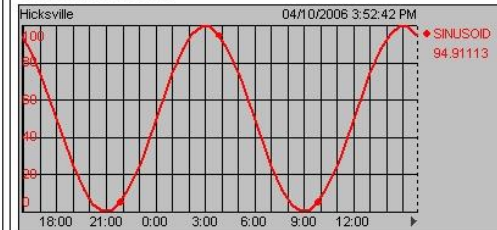
## Interface and Server Health Check

Close Screen

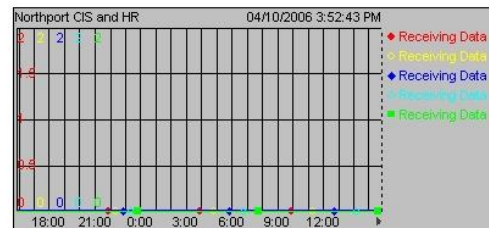
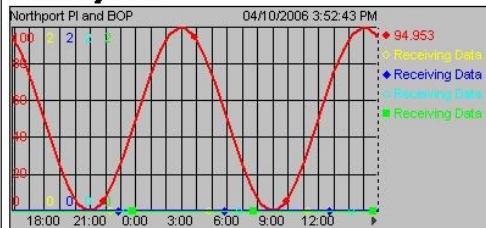
### Ravenswood



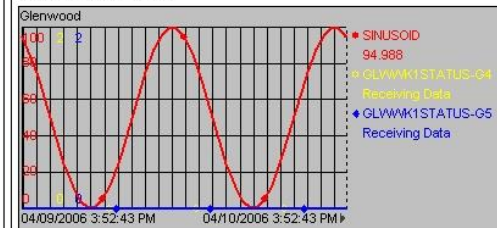
### Hicksville



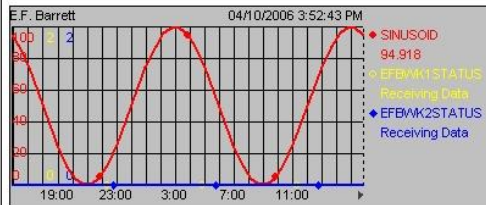
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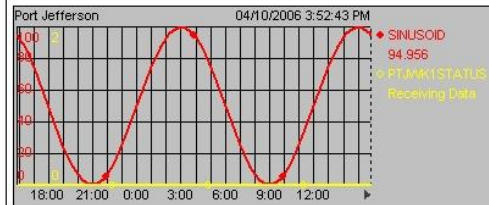
### Glenwood



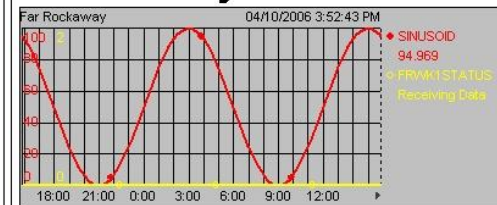
### E.F. Barrett



### Port Jefferson



### Far Rockaway



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# The Future

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# Future

- SmartSignal EPI\*Center
- Real time Turbine Performance Testing and Trend Notification
- Real time Boiler Feed Pump Testing and Trend Notification
- Development of a real time “what if” Distributed Control System (DCS) Simulator

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