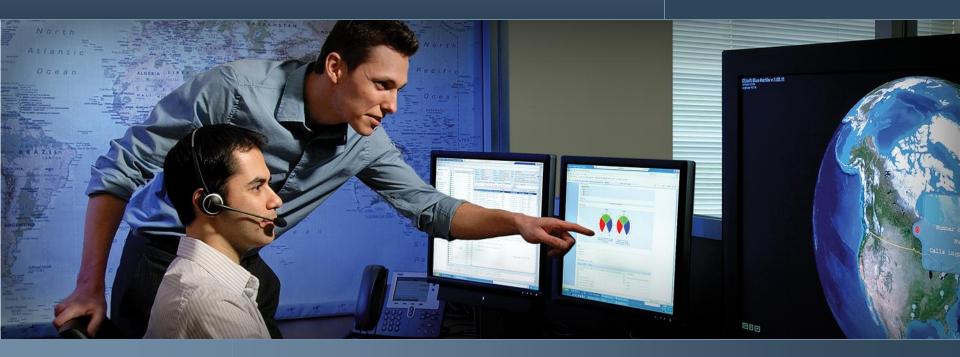# Regional Seminar Series
New York, NY

The Use of the PI System for fleet-wide Monitoring and Optimization at NRG Energy

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- Who is NRG Energy?

- PI System Architecture

- How PI System is used at the Plants

- Fleet-wide Monitoring and Reporting

- Benefits Realized to date

- Future Plans

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- Fortune 300 wholesale power generation company with HQ in Princeton, NJ & 5th largest in the Energy Industry.

- Owns and operates one of the industry's most diverse generation portfolios (includes coal, natural gas, oil, nuclear, wind and solar power) that provides ~24,000 Megawatts of electric generating capacity.

- In 2009, NRG purchased Reliant Energy, the second largest retail energy business in Texas, serving nearly 1.6 million business, industrial & residential customers.

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PI System Architecture

- 17 Plants currently running a PI System

- PI-to-PI interfaces from Plants to HQ/Regional office

- Central PI Systems located in Texas and Corporate offices (NJ)

- PI Systems in Texas/LaGEN Emergency Management System (EMS)
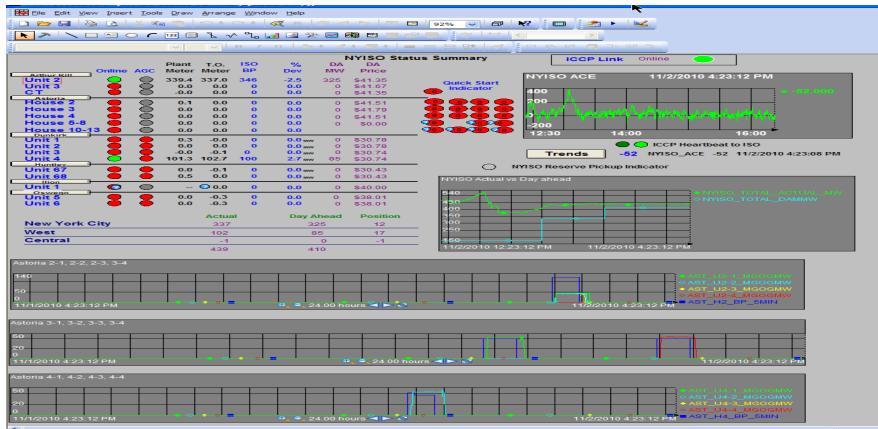
- PI WebParts provides fleet-wide dashboards/reports

The versatility of PI System allows NRG to utilize this platform to deliver viable solutions that support various aspects of our business.

- Real-Time Trading (Princeton, NJ and Texas)

- Settlements Audit of ISOs

- Improving Overall Plant and Fleet Performance

- Monitoring NOx Emmissions

- Troubleshooting issues at Plants (unit trips, de-ratings, etc…)

How are we using PI System?

- Real-Time Trading (Princeton and Texas) – when PI System was implemented at NRG it was initially used to by the real-time trading group to monitor how are plants were being dispatched

How are we using PI System?

- Settlement Audits (ISOs) – NRG uses datalink to audit the megawatt generation the ISOs document for NRG

How are we using PI System?

- Improving Plant Performance – utilize PI System to monitor the startup of our units, helps operators to identify issues during startup procedures

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How are we using PI System?

- Monitoring NOx Emissions - In the Texas ERCOT market we have to manage our NOx emissions. We use PI System to ensure we are within allocated limits for the region

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Future Plans for PI System at NRG

- Improve fleet-wide reporting

- Condition-based Maintenance (fleet-wide)

- Improving Plant Performance (fleet-wide)

- Operator Box initiative

- NERC monitoring (Plant Level)

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Steam Purity Report

t Operations > Steam Purity > Water Chemistry Report Monthly

Water Chemistry Report Monthly

RtGraphic

MONTHLY: STEAM PURITY CHEMISTRY REPORT

Steam Purity Index - Trending
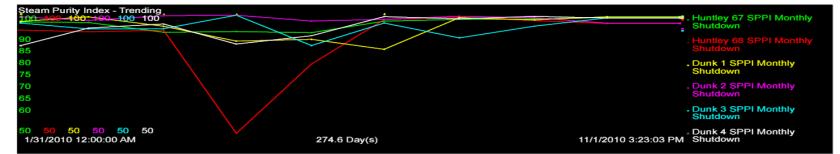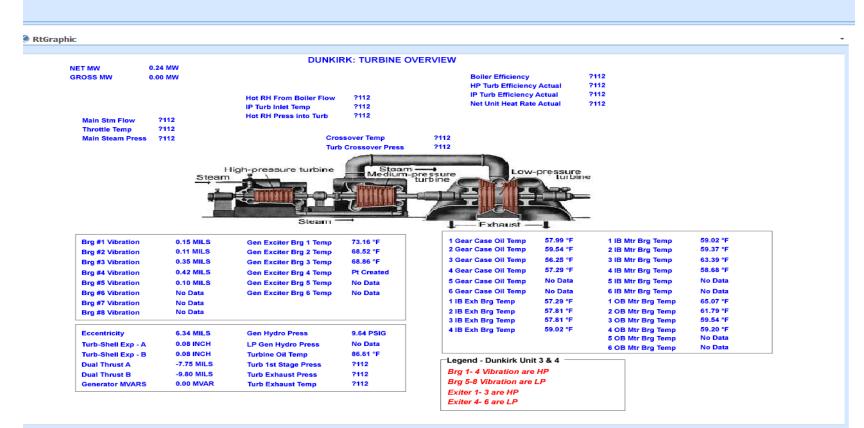
- Huntley 67 SPPI Monthly Shutdown
- Huntley 68 SPPI Monthly Shutdown
- Dunk 1 SPPI Monthly Shutdown
- Dunk 2 SPPI Monthly Shutdown
- Dunk 3 SPPI Monthly Shutdown
- Dunk 4 SPPI Monthly Shutdown

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Steam Purity Index Table - Month Ending

Plant	Unit	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Huntley	Huntley 67	97.17	96.91	92.79	93.08	92.61	97.48	98.23	98.42	99.04			
Huntley	Huntley 68	93.71	93.00	93.62	50.00	79.36	98.18	99.12	97.74	96.49			
Dunkirk	Dunkirk 1	97.35	99.30	95.33	89.04	89.80	85.57	98.96	98.02	99.35			
Dunkirk	Dunkirk 2	100.00	99.29	97.81	100.00	97.53	98.24	99.57	98.95	96.62			
Dunkirk	Dunkirk 3	96.69	94.20	94.29	100.00	87.17	96.69	90.41	95.38	98.87			
Dunkirk	Dunkirk 4	87.14	94.56	96.30	87.79	91.32	99.40	98.48	99.49	98.82			

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Thank you