OSIsoft® UC 2010

Real Time Information — Currency of the New Decade

Hilton San Francisco Union Square | San Francisco, CA

April 26-28, 2010

Mobile PI Data Improves Tracking of Customer Power Outages at Duke Energy

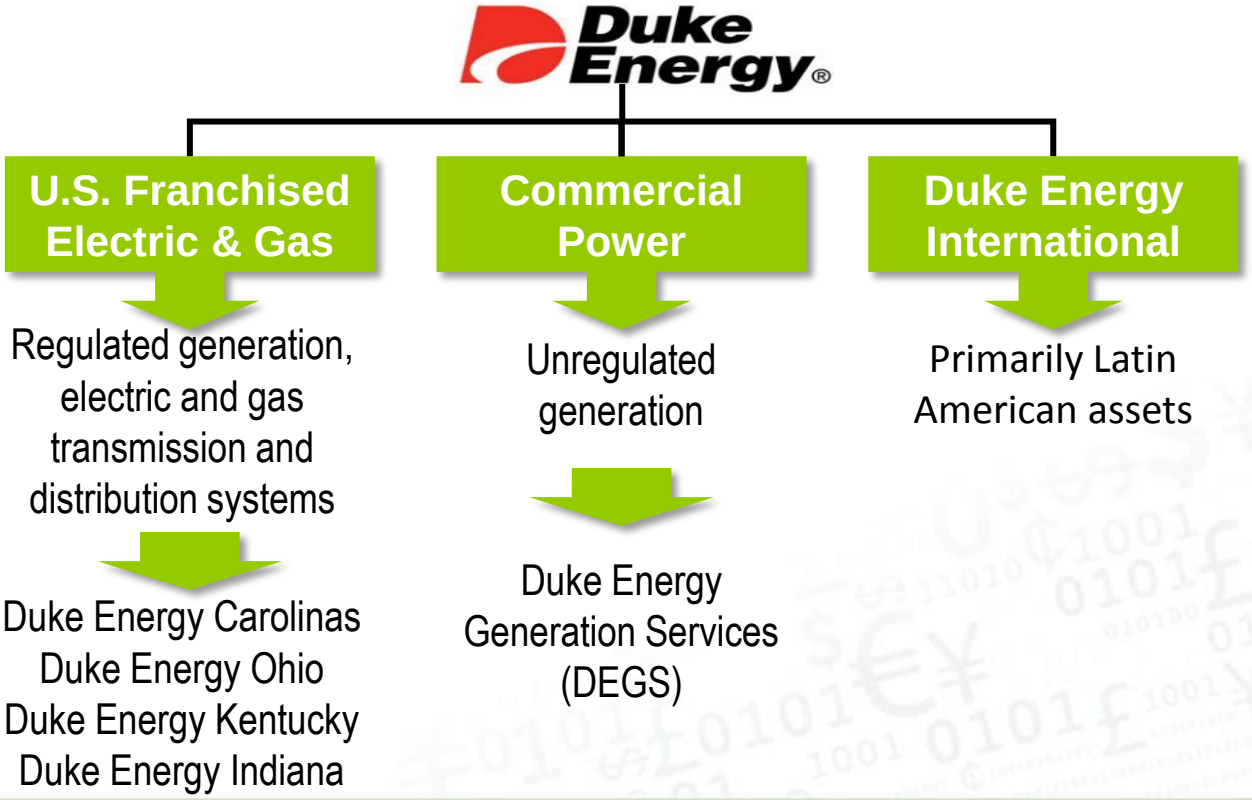
Tim Murphy, IT Manager, PI Support Team,
Duke Energy

Michael Saucier, CEO, Transpara

FACTS ABOUT DUKE ENERGY

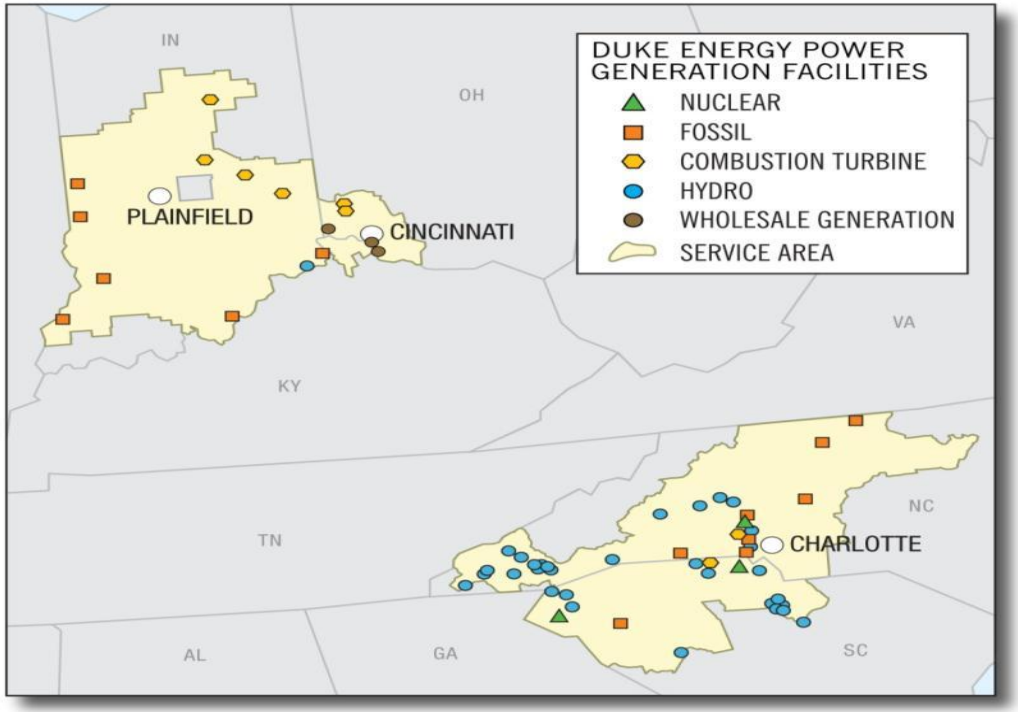
- 150+ years of service
- 4 million customers
- Fortune 500
- $50 billion in assets
- Stock dividends for 80+ years
- Traded on NYSE as DUK
- Dow Jones Sustainability Index

THE BUSINESSES WE'RE IN



U.S. FRANCHISED ELECTRIC AND GAS

- 5 states: North Carolina, South Carolina, Indiana, Ohio and Kentucky
- 47,000 square miles of service area
- 28,000 MW of regulated generating capacity
- 4.0 million retail electric customers
- 500,000 retail gas customers



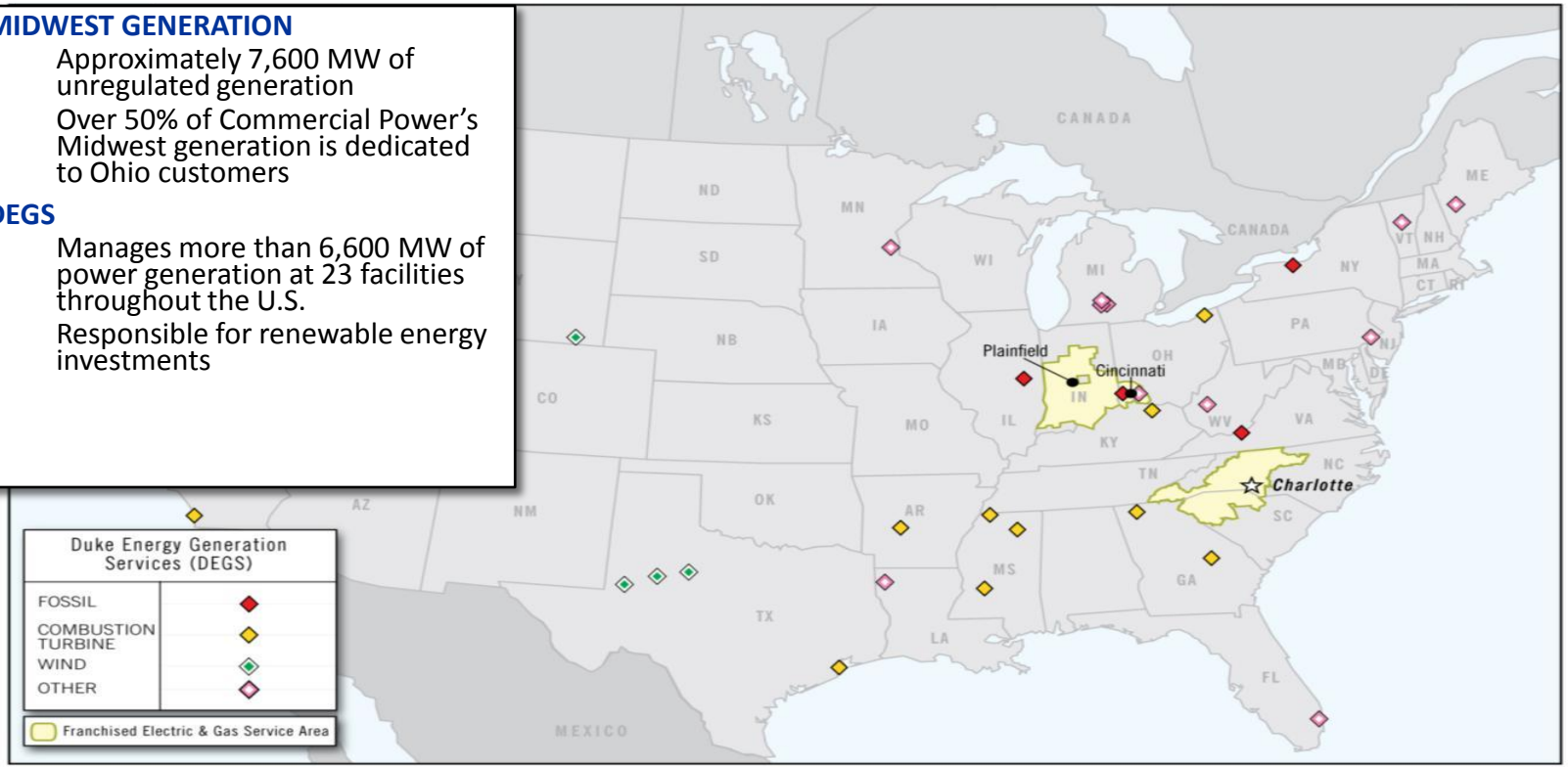
COMMERCIAL POWER

MIDWEST GENERATION

- Approximately 7,600 MW of unregulated generation
- Over 50% of Commercial Power's Midwest generation is dedicated to Ohio customers

DEGS

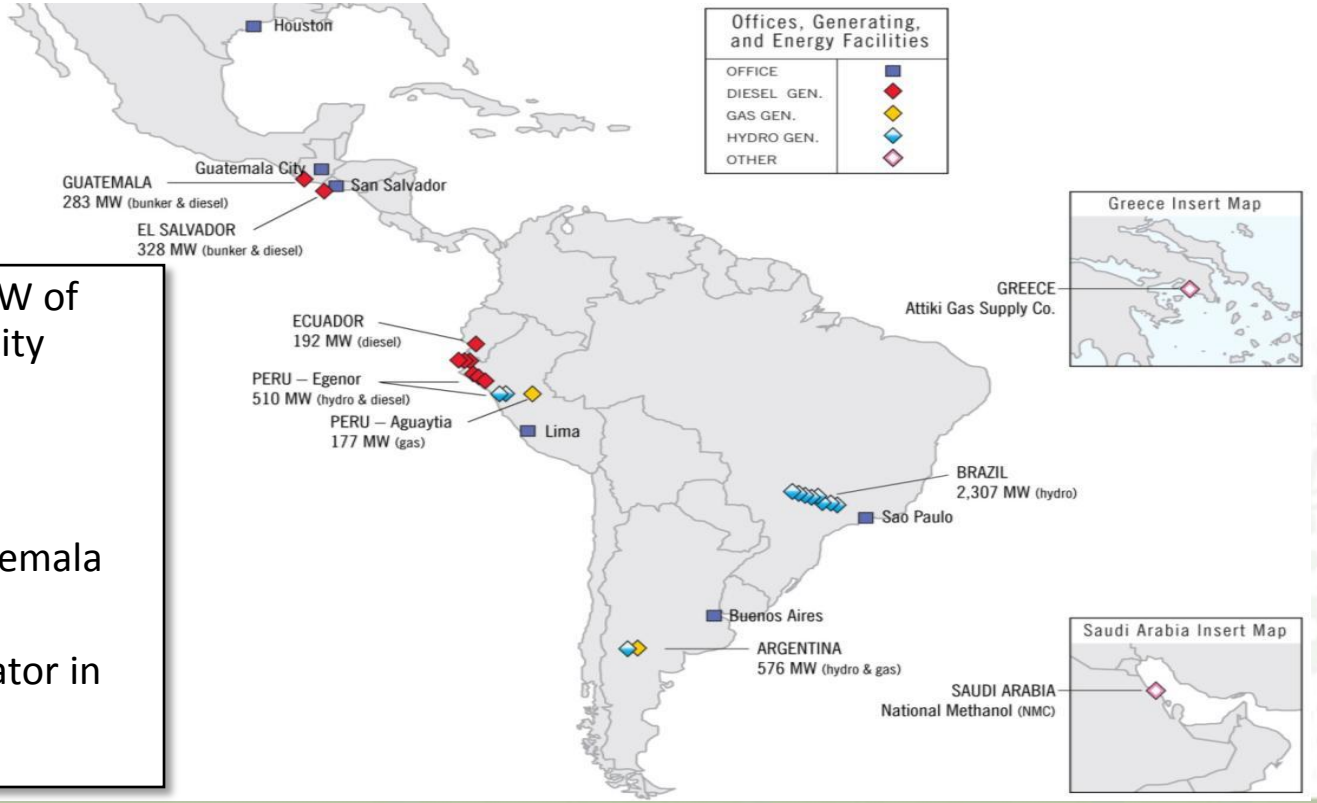
- Manages more than 6,600 MW of power generation at 23 facilities throughout the U.S.
- Responsible for renewable energy investments



DUKE ENERGY INTERNATIONAL

- Approx. 4,000 MW of generating capacity
- 6 countries:

  Argentina, Brazil, Ecuador,
  El Salvador, Guatemala and Peru
- 4th largest generator in Latin America
  (based on net capacity)



BACKGROUND

- Duke: a mature PI customer
  - 17 years
  - 95 sites
  - 3000+ users
  - 65 PI servers
    - collecting data for hundreds of thousands of points

PI Software Environment

- Asset License Agreement
- PI Enterprise Server
- ProcessBook
- DataLink
- ACE
- PI WebParts
- PI Tag Monitor (built in-house, not OSIsoft product)
- PI Manual Editor (built in-house, not OSIsoft product)
- PI Applications
- Custom Data Extraction Interfaces (API/SDK)

The Problem

- Bad weather causes customer power outages.
- Outages must be tracked during an event.
- Outages > 50,000 must be reported to regulatory agencies.
- DOE-OE-417 Report – Must notify DOE within six hours when outages > 50K and is sustained for 1 hour.
- Copies to NERC and SERC.

The Problem

The Problem

The Problem

THE SOLUTION: MANUAL (prior to 2006)

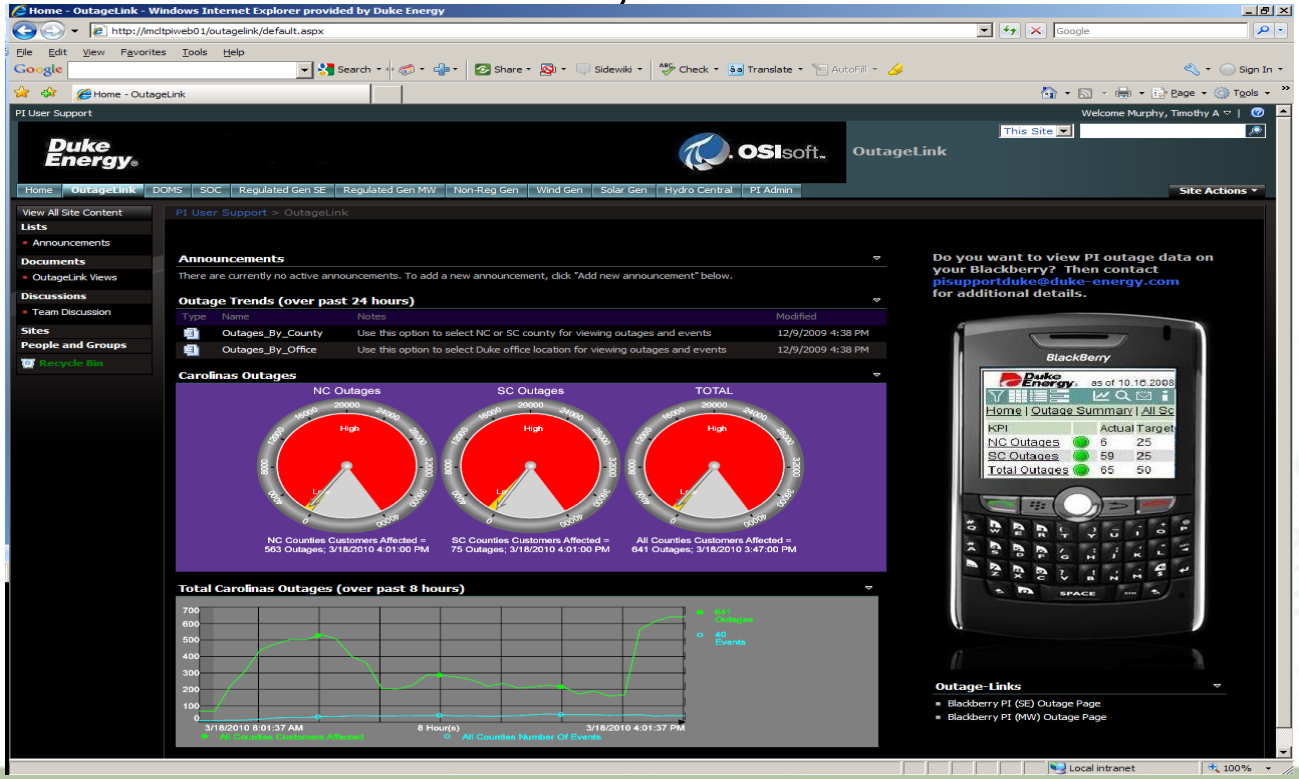
- Customers report power outages.
- Predictor software estimates total outages.
- Charts of customer outages created manually (spreadsheet) for distribution.
- Data available only during a storm event.

THE SOLUTION: AUTOMATED (2006)

- Utilized PI for managing this data
- Data from ORACLE feeds into PI every 15 minutes
- Data is displayed on Duke Energy's Internal Portal using PI WebParts
  - By State
  - By County
  - By Office

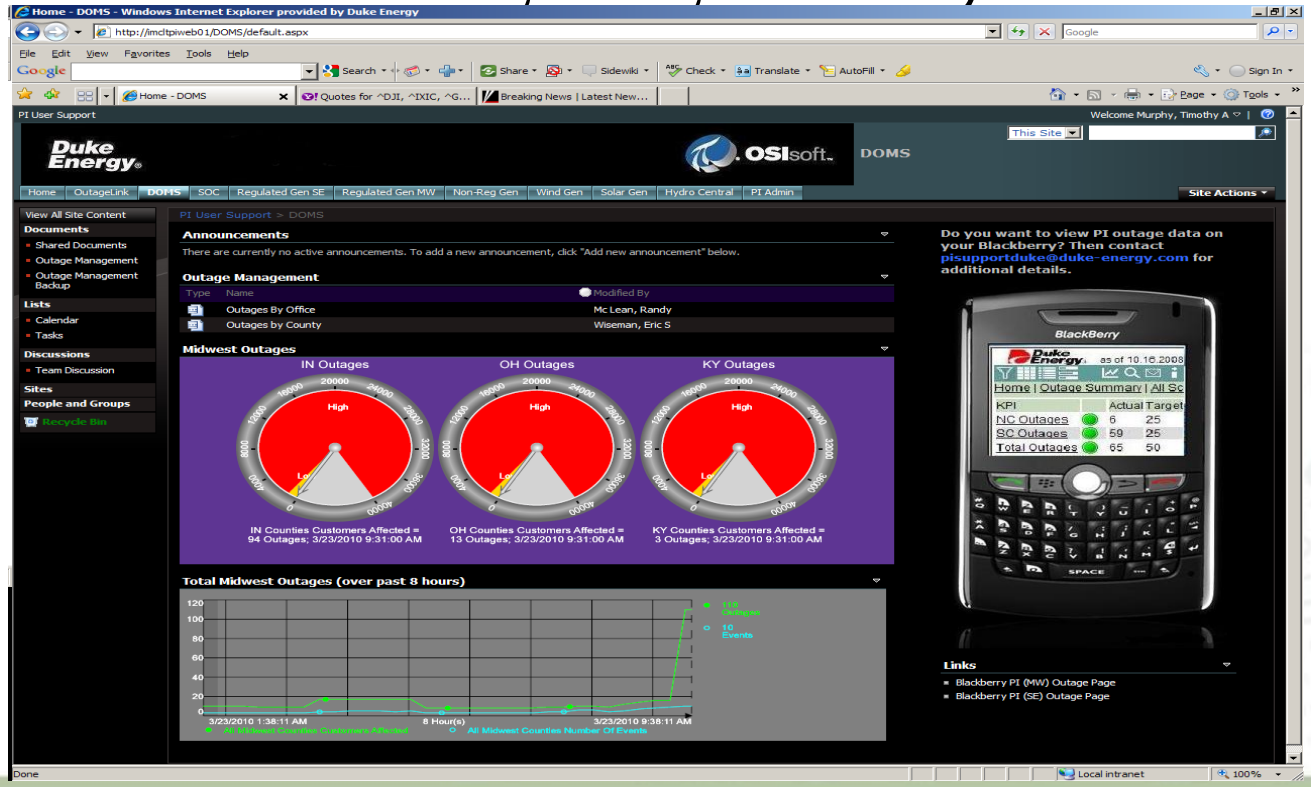
THE SOLUTION: AUTOMATED

North Carolina, South Carolina



THE SOLUTION: AUTOMATED

Indiana, Ohio, Kentucky



THE SOLUTION: AUTOMATED

- Data available around the clock, 365 x 24 x 7.
- An alert was established to notify key personnel after # outages reached 20K
- An alert was established to notify compliance personnel after # outages reached 50K

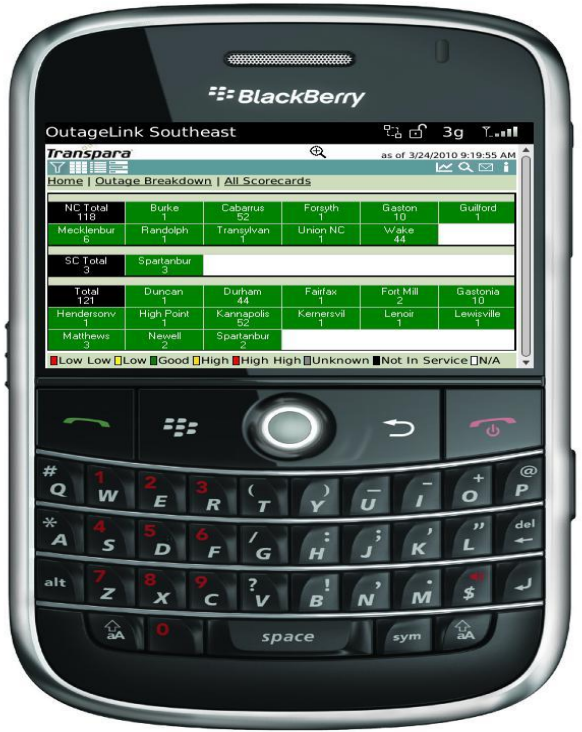
THE SOLUTION: Mobile

- Piloted Transpara's Visual KPI during Fall 2008
- Purchased Visual KPI in 2009
- Existing outage metrics now available on mobile devices
- Extends "reach" of PI applications to new class of users

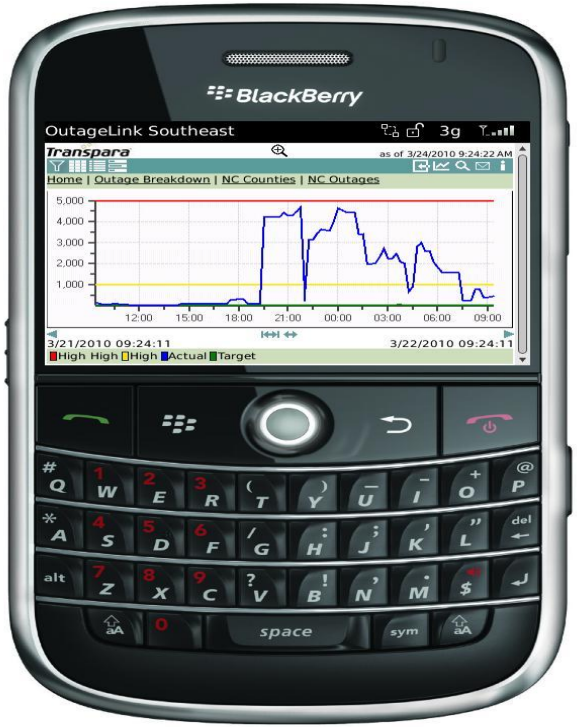
THE SOLUTION: Mobile

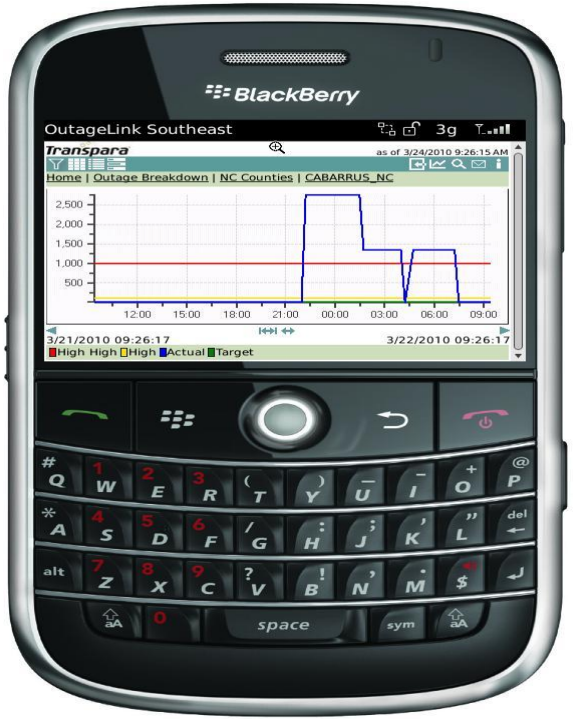
- Currently 43 users receiving customer outage data on four types of Blackberry devices
  - 8830 World Edition
  - Storm
  - Tour
  - Bold

THE SOLUTION: Mobile



THE SOLUTION: Mobile





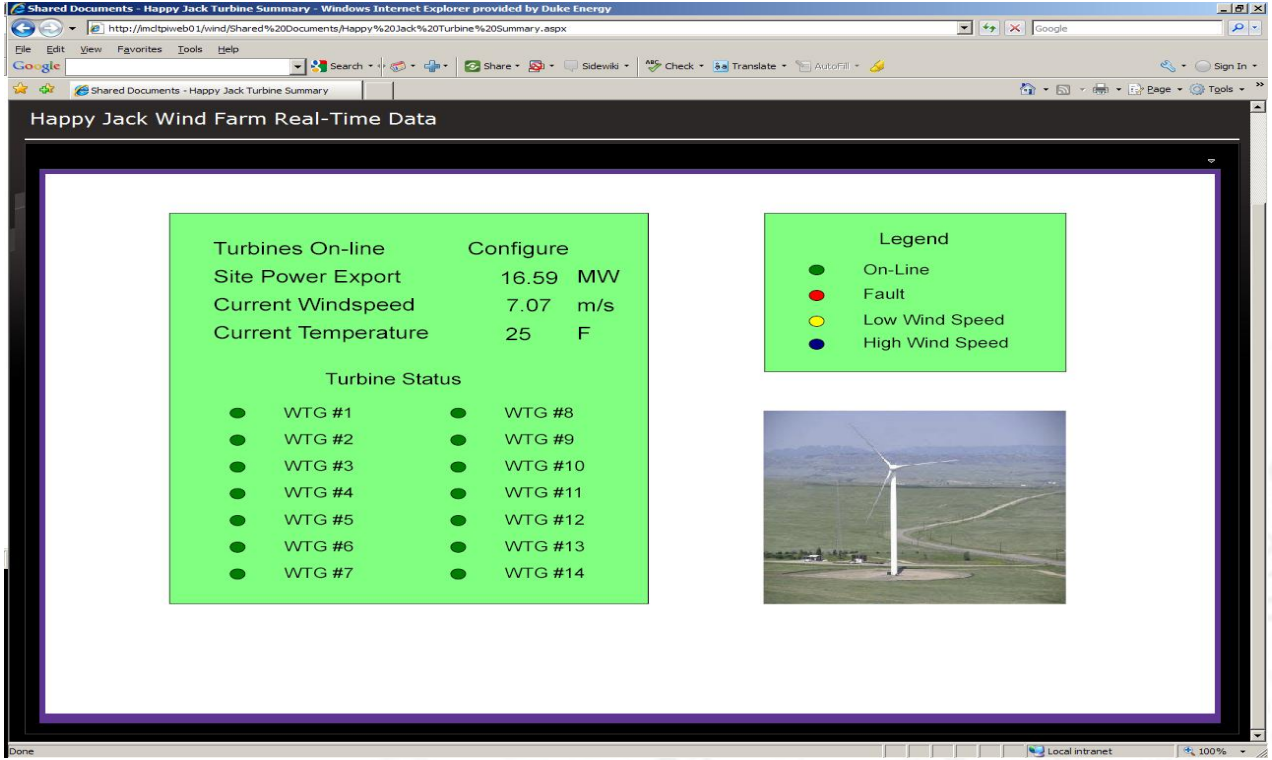
RESULTS

- Eliminated around the clock staff to chart customer outages during storms
- Data available immediately via company portal to anyone that needs it
- Multiple visual formats available via PI WebParts
- Data now available 365 days per year, 24x7

RESULTS

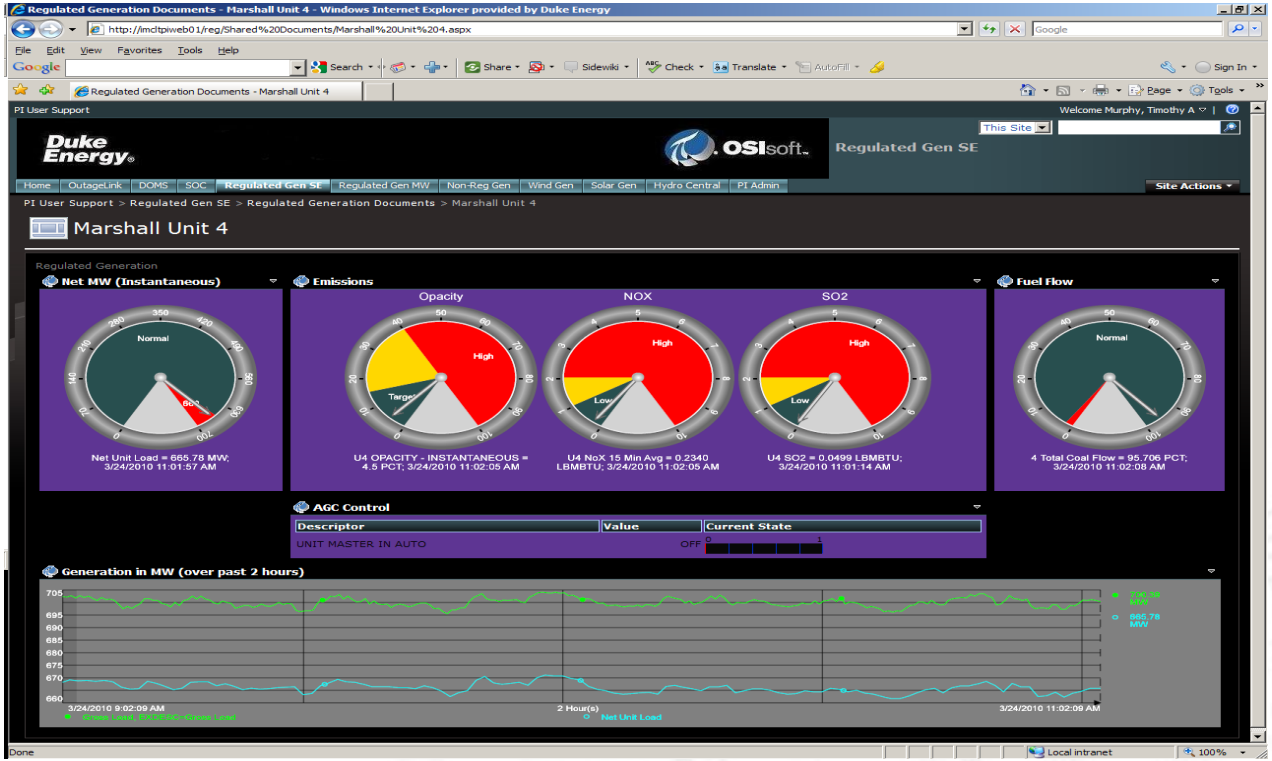
- Maximized Availability of PI Data
- Data available on mobile device any time, any where

Other Examples of PI WebParts



Other Examples of PI WebParts

Other Examples of PI WebParts

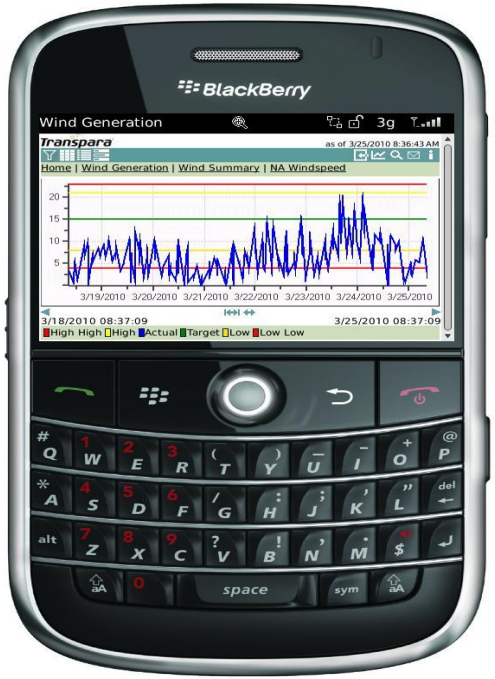


Other Visual KPI Displays

- Lake Levels
- Generation Levels
- Wind Speed
- Plant Data (temperatures, pressures, etc)
- Breaker Status
- Balancing Authority Statistics

Other Visual KPI Examples
Wind Generation

Other Visual KPI Examples
Wind Speed



Other Visual KPI Examples

Carolinas Generation

Transpara

as of 3/25/2010 8:42:59 AM

Home | Generation Unit Summary | All Scorecards

Scorecard: Nuclear Summary

CNS U1 1226 MW	CNS U2 1230 MW	MNS U1 0 MW	MNS U2 1202 MW	ONS U1 903 MW	ONS U2 907 MW	ONS U3 915 MW

Scorecard: Fossil Summary

ALN U1 122.3 MW	ALN U2 0.0 MW	ALN U3 282.0 MW	ALN U4 293.7 MW	ALN U5 262.4 MW	BLC U1 1204 MW	BLC U2 0 MW	BUK U3 -6.6 MW	BUK U4 0.0 MW	BUK U5 80.9 MW	BUK U6 66.9 MW	CLF U1 0.0 MW	CLF U2 0.0 MW
CLF U3 0.0 MW	CLF U4 0.0 MW	CLF U5 0.0 MW	DRV U1 0.0 MW	DRV U2 0.0 MW	DRV U3 -0.5 MW	LEE U1 0.0 MW	LEE U2 0.0 MW	LEE U3 185.6 MW	MAR U1 399.5 MW	MAR U2 399.3 MW	MAR U3 0.0 MW	MAR U4 700.5 MW
RIV U4 0.0 MW	RIV U5 0.0 MW	RIV U6 0.0 MW	RIV U7 0.0 MW									

Scorecard: Hydro Summary

BE U1 0.0 MW	BW U1 10.6 MW	BW U2 10.7 MW	BR U1 0.0 MW	BR U2 2.8 MW	BR U3 2.7 MW	CL U1 0.0 MW	CC U1 14.3 MW	CC U2 14.3 MW	CC U3 14.1 MW	CF U1 0.0 MW	CF U2 79.1 MW	CF U3 79.0 MW
CF U4 0.0 MW	DB U1 43.2 MW	FC U1 9.7 MW	FC U2 9.7 MW	FC U3 9.6 MW	FC U4 11.0 MW	FC U5 8.7 MW	GS U3 0.0 MW	GS U4 1.7 MW	GS U5 0.0 MW	GS U6 0.0 MW	GF U1 0.0 MW	GF U2 0.0 MW
GF U3 0.0 MW	GF U4 0.0 MW	GF U5 0.0 MW	GF U6 0.0 MW	KE U1 0.0 MW	KE U2 0.0 MW	LO U1 0.0 MW	LO U2 9.7 MW	LO U3 9.6 MW	MI U1 0.0 MW	MI U2 12.5 MW	MI U3 15.8 MW	MI U4 15.8 MW
NN U1 4.2 MW	NN U2 3.4 MW	NN U3 4.2 MW	NN U4 3.3 MW	OX U1 -0.5 MW	OX U2 18.9 MW	RH U1 0.0 MW	RH U2 0.0 MW	RH U3 9.4 MW	RC U1 0.0 MW	RC U2 0.0 MW	RC U3 0.0 MW	RC U4 0.0 MW
RC U5 0.0 MW	RC U6 0.0 MW	RC U7 0.0 MW	RC U8 0.0 MW	TC U1 8.0 MW	TH U1 0.0 MW	TX U1 3.9 MW	TX U2 0.0 MW	WA U1 15.9 MW	WA U2 16.3 MW	WA U3 15.7 MW	WA U4 15.7 MW	WA U5 16.2 MW
WY U1 16.1 MW	WY U2 16.5 MW	WY U3 16.6 MW	WY U4 15.9 MW									

Scorecard: Pumped Storage

BD U1 -2.9 MW	BD U2 -0.3 MW	BD U3 -1.9 MW	BD U4 -5.2 MW	JO U1 0.0 MW	JO U2 0.0 MW	JO U3 150.0 MW	JO U4 0.0 MW

Scorecard: CT Summary

LCT U1 0.0 MW	LCT U2 0.0 MW	LCT U3 0.0 MW	LCT U4 0.0 MW	LCT U5 0.0 MW	LCT U6 0.0 MW	LCT U7 0.0 MW	LCT U8 0.0 MW	LCT U9 0.0 MW	LCT U10 0.0 MW	LCT U11 0.0 MW	LCT U12 0.0 MW	LCT U13 0.0 MW
LCT U14 0.0 MW	LCT U15 0.0 MW	LCT U16 0.0 MW	MC U1 0.0 MW	MC U2 0.0 MW	MC U3 0.0 MW	MC U4 0.0 MW	MC U5 0.0 MW	MC U6 0.0 MW	MC U7 0.0 MW	MC U8 0.0 MW	RO U1 0.0 MW	RO U2 0.0 MW
RO U3 0.0 MW	RO U4 0.0 MW	RO U5 0.0 MW										

Low Low | Low | Good | High | High High | Unknown | Not In Service | N/A

Thank you