



# A Bigger Piece of the PI

## Providing Tools to Improve the Distribution PI System

Presented by **Tim Amon**  
**Ryan Lee**



conEdison, inc.



Orange & Rockland

# Agenda

- About Consolidated Edison Company of New York
- PI System Overview
- Features and Tools
- Operational Example
- Growing and Improving the System
- Next Steps

# Energy for New York City And Westchester

- **3.36 million electric customers**
- **36,000 miles of overhead transmission and distribution lines**
- **94,000 miles of underground transmission and distribution lines**
- **Record System Load: 13,322 MW**
- **1.1 million gas customers**
- **4,300 miles of gas mains**
- **1,700 steam customers**
- **105 miles of steam mains and lines**
- **690 MW of regulated generation**



# PI Systems Overview

## Steam



## Gas

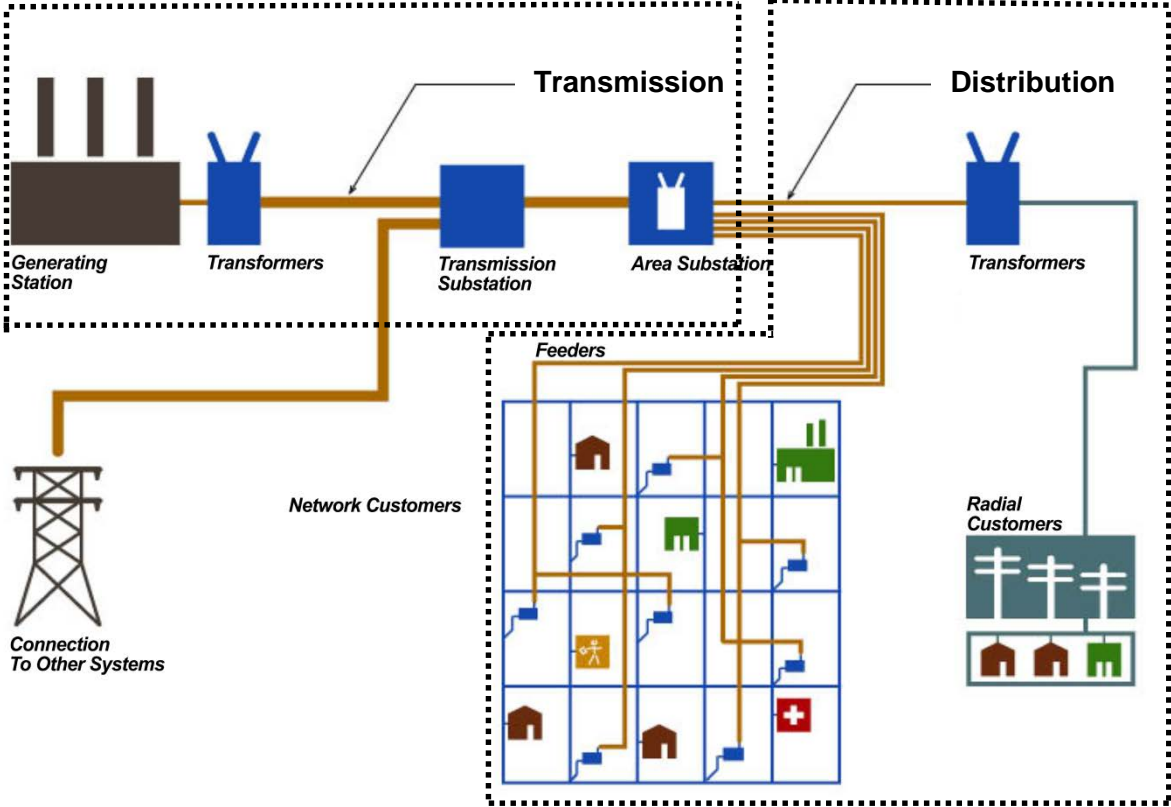


## Electric



# PI Systems Overview

## Electric



# Distribution PI System

## Quick Facts

- PI System Implementation
  - Phase 1: Completed April 2014
  - Phase 2: Asset Framework April 2015
- 1.5 Million PI Tags
- Data from SCADA Master and other legacy systems



# Expansive Distribution System

- 2000 Overhead Reclosers
- 200 Underground Sectionalizing Switches
- 239 Unit and Multi-Bank Substations
  - 4kV Primary Grid System
- Others
  - Photovoltaic Sites
  - Network Protectors
  - Pole Top Voltage Regulators
  - Load Tap Changer Monitoring



# Features and Tools For Empowering Users

- Training and Customer Involvement
- Developing New Features
  - Improve User Friendliness
  - SCADA Mimic Displays
  - Email Notifications
  - Calculations and Formulas
- PI Coresight





Which Station is this?

Ethsta

Ethelrige Station

# PI Asset Framework (AF) The Foundation

- Meaningful Station Names and Descriptions
- Intuitive Hierarchy
- Static Data
- Building-Block for Tools and Features

The screenshot displays the PI System Explorer interface for VELECOPS-PI AF Distributed SCADA. The left pane shows a hierarchical tree of elements, including 'Brooklyn' and 'Overhead Switches'. The main pane shows a table of attributes for the selected element, 'A PHASE CURRENT'. The right pane shows the configuration details for this attribute.

Name	Value
A PHASE CURRENT	51 A
A PHASE PowerFactor	0
A PHASE VOLTAGE	0 V
AC Power	0 KVA
Auto/Manual	Auto
B PHASE CURRENT	52 A
B PHASE PowerFactor	0
B PHASE VOLTAGE	11 V
Battery Test	BT_off
C PHASE CURRENT	54 A
C PHASE PowerFactor	0
C PHASE VOLTAGE	0 V
Communication	IDIN
Continuous key mode	0
CTS-delay time in sec	0
Frequency crosses table index - RX...	0
Hot Line Tag	HL_Off
KVLA	0 kVA
KVA B	148 kVA
KVA C	0 kVA
KVAR A	0 KVAR
KVAR B	101 KVAR
KVAR C	0 KVAR
KWATT A	0 kW
KWATT B	-106 kW
KWATT C	0 kW
Location	Junkie St. Bet. Livonia Ave. & Riverdale Ave.
NEUTRAL PHASE CURRENT	7 A
OC Lockout Phase A	Oncom
OC Lockout Phase B	Oncom
OC Lockout Phase C	Oncom
Pole Latitude	40.66286

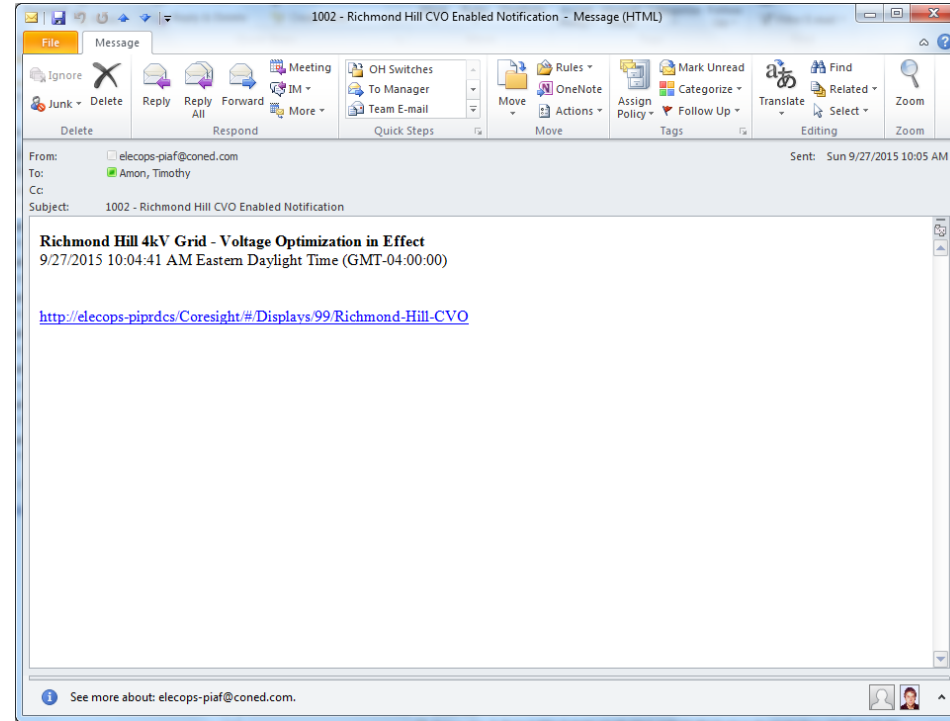
Attributes: A PHASE CURRENT  
Description: [Empty]  
Configuration Item: [Empty]  
Categories: Amps  
Default LDM: ampere  
Value Type: Double  
Units: S1 A  
Data Reference: PI Point  
Settings: [Empty]

VELECOPS-PI PROD:1054\_2748 - A PHASE CURRENT

2748 Modified:3/18/2015 4:30:33 PM, Version:1/1/1970 12:00:00 AM, Revision:2

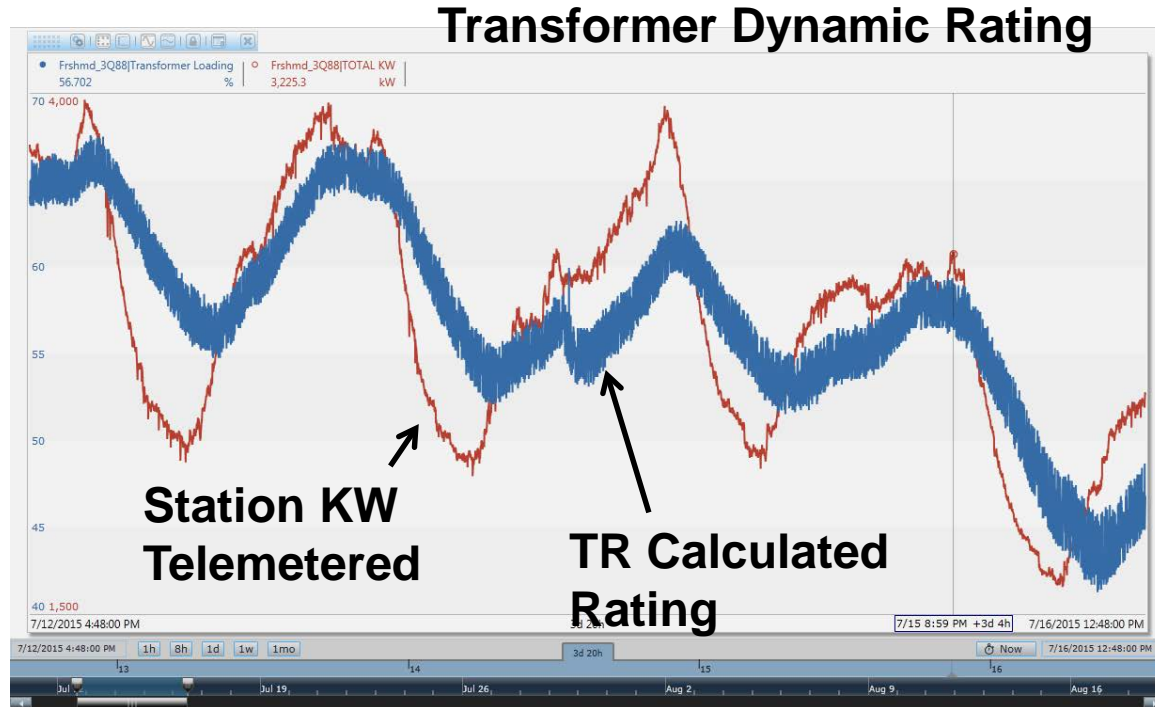
# Email Notifications For Real-Time Awareness

- Engineering and Maintenance Alerts
  - Breaker Status
  - RTU Offline
  - Battery Voltage
  - Current Imbalance
- Easily Configurable
- Template Based

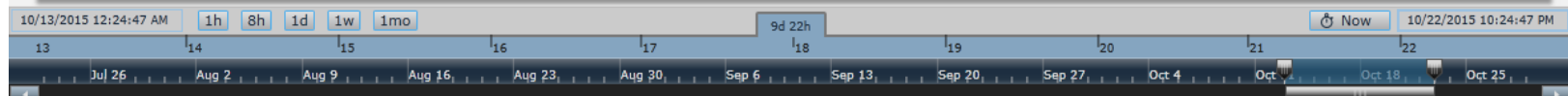
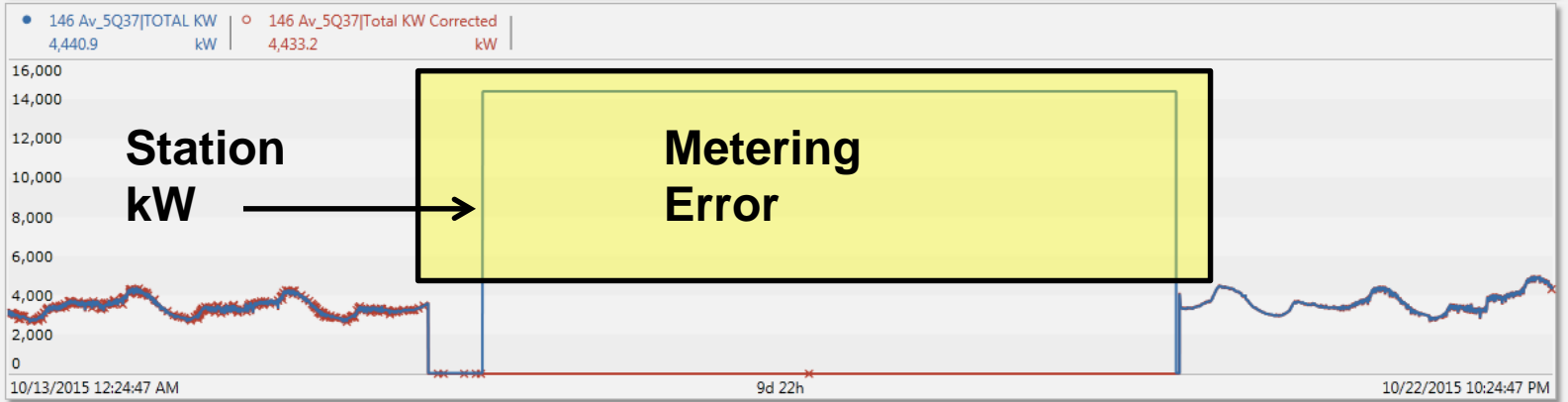


# PI Calculations For “Better” Data

- Transformer Dynamic Rating
  - Real-Time Transformer “Health” based on temperature
- SCADA Corrections
  - Correct for Metering Errors
- Total kW Loading
  - Monitor a Load Area and Detect Outages



# Corrected SCADA Data



# Total KW Loading



# Heat Event 2015

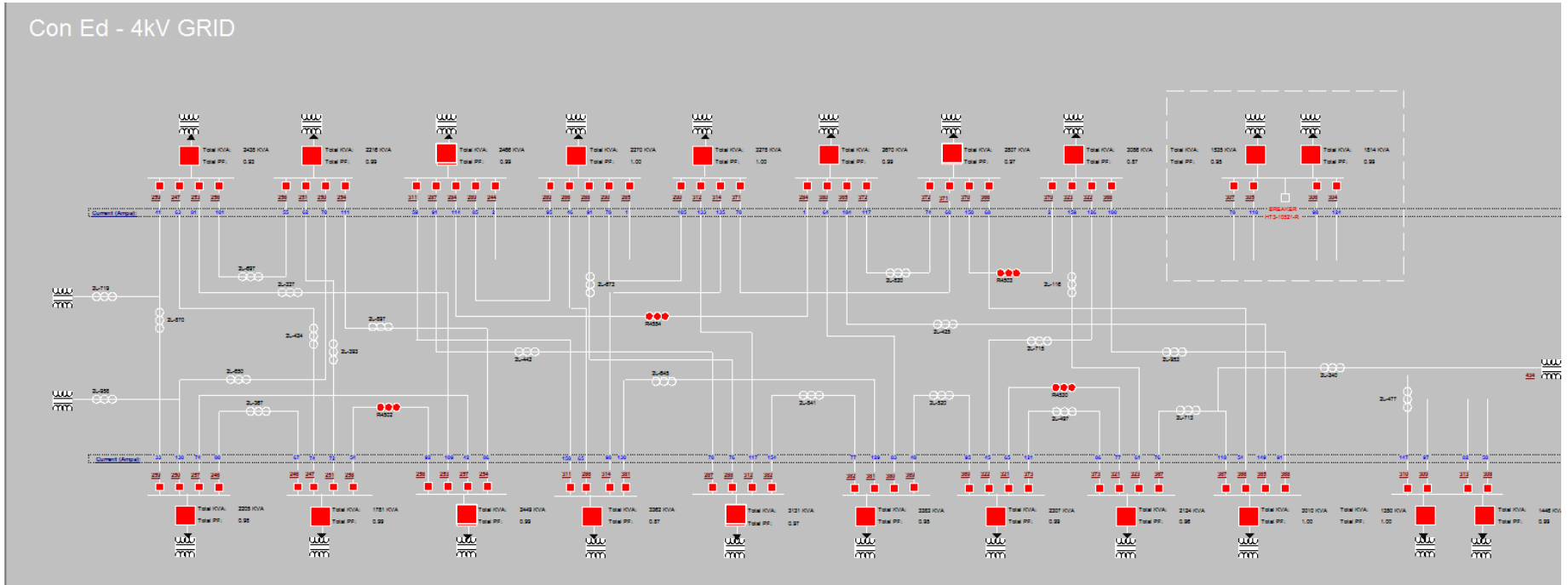
## The PI System for Operational Support

- DE Situation Room
  - PI ProcessBook Mimics
  - Real-time Event Analysis
- Post Event Analysis
  - PI DataLink
  - New Calculations and Alerts



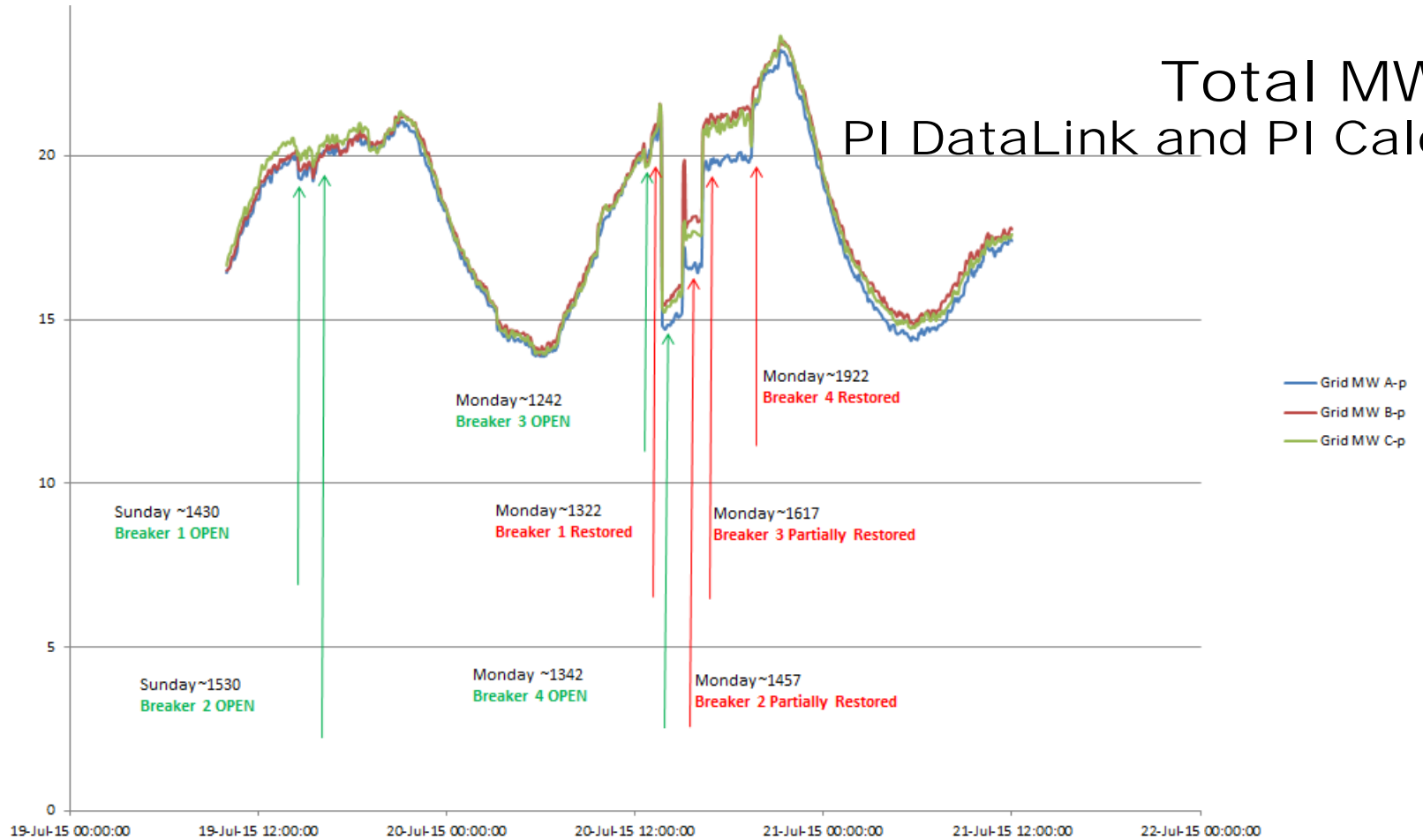
# Heat Event 2015 PI ProcessBook Display

Con Ed - 4kV GRID





# Total MW PI DataLink and PI Calc



# Growing the Electric Distribution PI System

- Official Distribution Historian
- Replacing Legacy Systems
- One Source for Data Management and Information
- Used Extensively During our ICS and CERC Events



# Next Steps

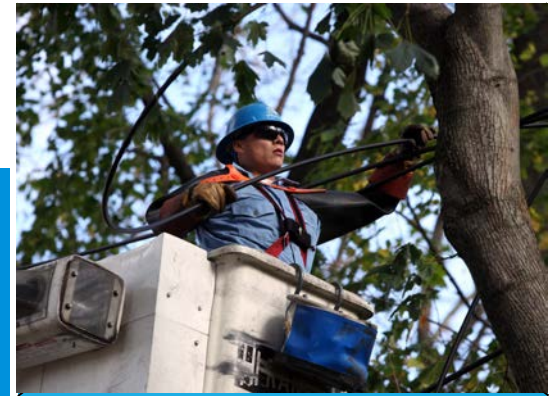
- Transition to latest PI System Applications
- Expanding and Growing
- Automating Display Update Process



# The PI System as more than a Historian

## COMPANY and GOAL

Con Edison is the Energy Provider for NYC and Westchester, and wanted to improve our data collection and management on the electric distribution system.



## CHALLENGE

Multiple Legacy SCADA and Data Collection systems that are not as flexible.

- Different systems managed by different teams
- Difficult to implement changes and limited tools available for users

## SOLUTION

The PI System offered an easily configurable and flexible system to consolidate and improve these systems.

- PI Coresight allows information to be quickly and easily captured; empowering our users
- PI is a central data source, which can feed automatic notifications, calculations, etc.

## RESULTS

The PI System tools and features allow us to do proactive and real-time response to system events.

- Email alerts allows immediate notification, and proactive response.
- Improve the way engineers and operations view and analyze data

# Contact Information

## **Tim Amon**

amont@coned.com

Engineer

Con Edison

## **Ryan Lee**

leery@coned.com

Engineer

Con Edison

# Questions

Please wait for the **microphone** before asking your questions



State your **name & company**

# Please don't forget to...

Complete the Survey  
for this session



The Power of Data  
DECISION READY IN REAL-TIME

## Evaluation Form (Seminar Location - Date)

Name: \_\_\_\_\_ Company: \_\_\_\_\_

Email: \_\_\_\_\_

Quality and content of the presentations	Poor	Good	Excellent	N/A
Welcome	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The Journey To Real-Time Operational Intelligence	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The Power of Connection	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Tank Level Management System	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Using the FI System to Aid in Troubleshooting Operational Aspects of Oil and Gas Well Drilling and Completion	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Unleash your Infrastructure	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Information on the Spot	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Wrap-up/Seminar Conclusion	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<b>Quality and organization of the seminar</b>				
Choice of date	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Time allowed for lunch/breaks	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Choice of presentations	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Days and time allowed for the presentation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



감사합니다

谢谢

Danke

Merci

Gracias

Thank You

ευχαριστώ

ありがとう

Спасибо

Obrigado