Turning **insight** into **action**.

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Panel Discussion

Presented by **Doug Taylor**

Back in the day…

- No access to data
- 3rd party SCADA systems
- Manufacturer's SCADA
- OPC access to data
- IEC Standards

Direct to Controller

- Dozens of tags becomes hundreds of tags, thousands of tags

The Panelist:

- Scott Marion
- Anthony Germain
- Sumanth Makunur
- Richard Freeman
- Rick Duesing

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Scott Marion

Edison Mission Group

EDISON
MISSION ENERGY®

An EDISON INTERNATIONAL® Company

Scott Marion – Sr. Analyst
"Real Time Applications"
Boston, MA

- Independent Power Producer / Energy Trading
- PJM / ERCOT Markets
- (7) Fossil Plants
- (29) Wind Farms
- Total Capacity of 11,274 MW

Plans for Direct to Controller Integration

- Fits Nicely into our Future PI System Architecture
  - Large Local Data Collection / Visualization
- Not Bound By OEM Provided Data Points
  - Increased Real-Time Monitoring via the PI System
- Further Enables Predictive Monitoring
  - Early Warning of Turbine Issues
  - Creation of Fault Specific Trends / Predictive Models

Business Value of Direct to Controller Integration

- Local - Site Personnel
  - Ability to View / Trend Data Previously Not Available
  - Ease Transition from OEM to Site Personnel

- Remote – 24/7 Wind Operations Desk
  - Real-Time Monitoring Through a Single Interface
  - Expansion of Engineering & Analytic Roles as more Wind Farms come off of OEM Agreements

Future Plans and Next Steps

- Complete upgraded PI System Architecture Rollout
- Evaluate What Others Have Accomplished with Direct Controller Integration
- Seek Benefits in Support of our expanding 24/7 Wind Operations Desk

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Anthony Germain

EDF-EN

EDF EN : a multi-segment player

1

Main growth drivers

Wind Power

85% of the total installed capacity

Solar Power

Goal : 500MWp installed by the end of 2012

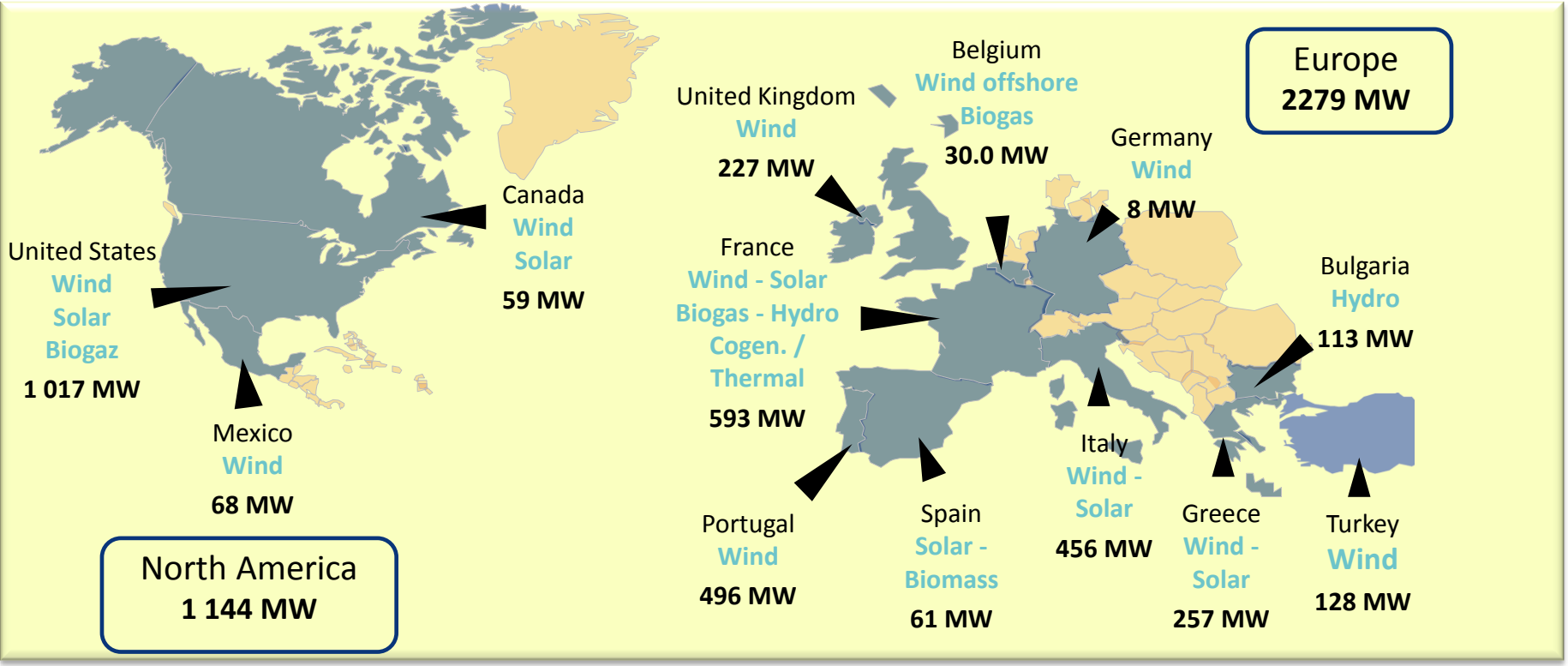
2

Promising markets

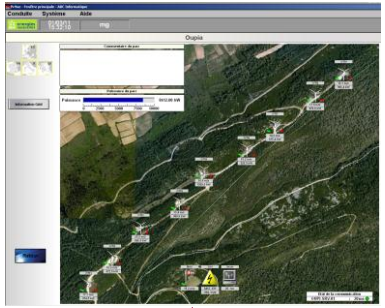
Distributed energies | Biomass | Biogaz | Marine energies | Offshore

Selective investments for ensuring future

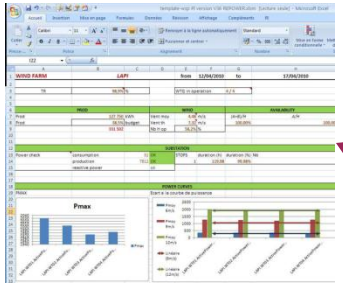
An international player :
3423 MW installed in 13 countries



PI System : a central tool to monitor our assets



PC Vue: Third party visualization software



PI Data Link: internal reporting

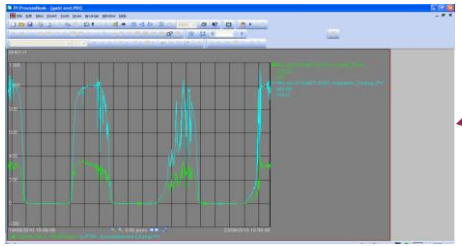
PI OPC DA

Central PI Server

PI to PI

Local PI server

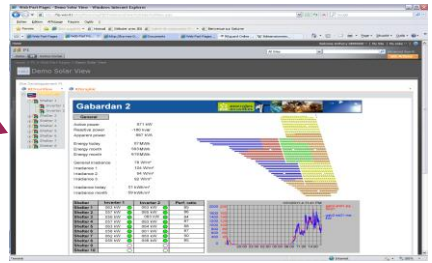
OPC/Modbus interfaces

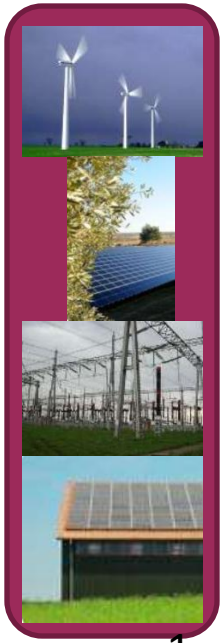


PI Process Book:

performance analysis and fault detection

Sharepoint: To publish views and reports to wind/solar farm owners





Direct to controller integration

-Not implemented yet , we are gathering data from SCADAs through various interfaces
-First attempt will be with Bachman controllers through the IEC 64500 protocol but still there is a manufacturer over layer presenting limitation

Direct to controller integration - Pros

- Accessing the entire set of data
- Accessing and modifying the parameters
- Sending commands to the controller
- Direct Access, no need of a third party software to gather data (often expensive) – better data covering rate
- We could completely integrate our assets into PI System without having to use legacy SCADAs (to send commands or change parameters)

Direct to controller integration - Cons

- Protocol used by the controllers, is a native PI System interface available?
- Manufacturer warranty?
- Are the manufacturers willing to give full access to the controllers?

Future Plans and Next Steps

- Test the IEC 64500 protocol with the Bachman controllers

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Sumanth Makunur

DTE Energy

About DTE Energy - Detroit Edison

DTE Energy Co.

- 10th largest electric utility & 11th largest gas utility
- $8.6 billion revenue
- 9,800 Employees
- Investing $1 billion in biomass, solar, wind and other renewable sources

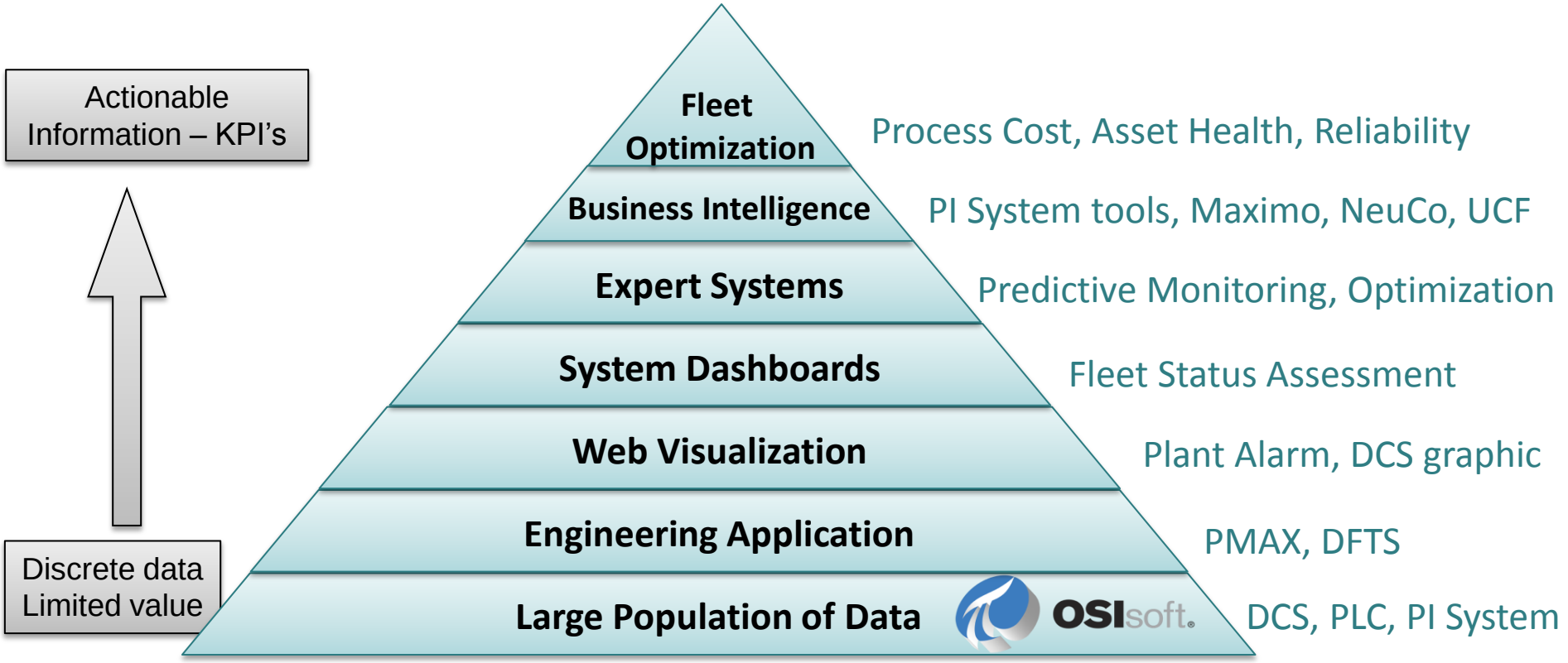
Detroit Edison

- Michigan's largest electric utility with 2.1 million customers
- Over 11,080 MW of power generation, primarily coal fired

DTE Energy Renewable Portfolio

- Wind Generation is the major contributor to the portfolio, Solar and other Bio-Fuels part of the mix.
- Plans are underway to meet Fed / Michigan mandated renewable generation targets.
- Several Wind Farms are anywhere between planning to construction phases
- DTE owned assets & PPA's to generate ~ 1000 MW by 2015.

Fossil Generation – Process Controls & Technology



Challenges / Plans

- Implement the Technology Framework on Renewable Assets.
- Data Acquisition OPC Vs Direct-to-Controller
- Vibration Monitoring Instrumentation
- Equipment Condition Monitoring
- Data Management Issues

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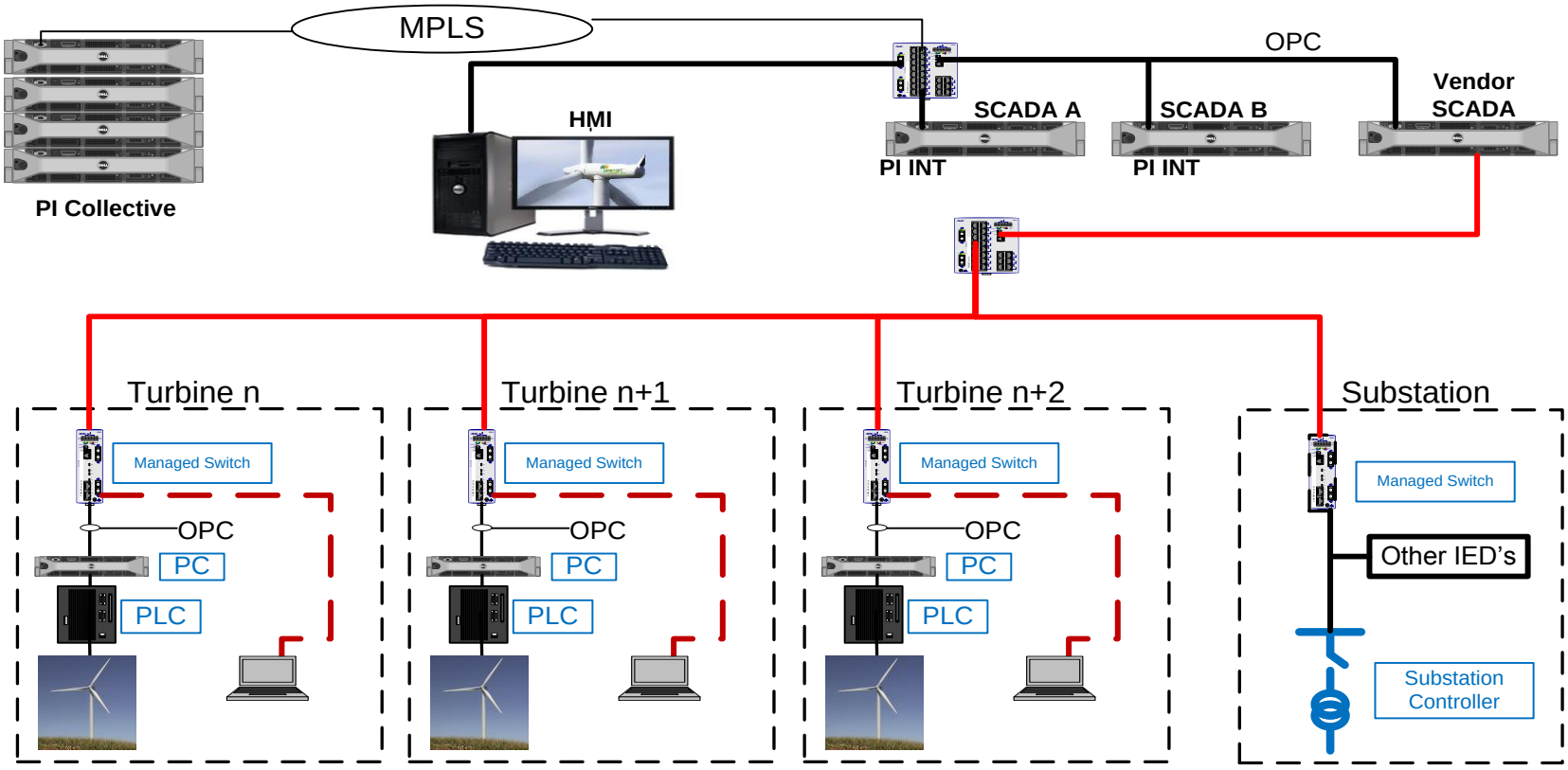
Richard Freeman

Iberdrola

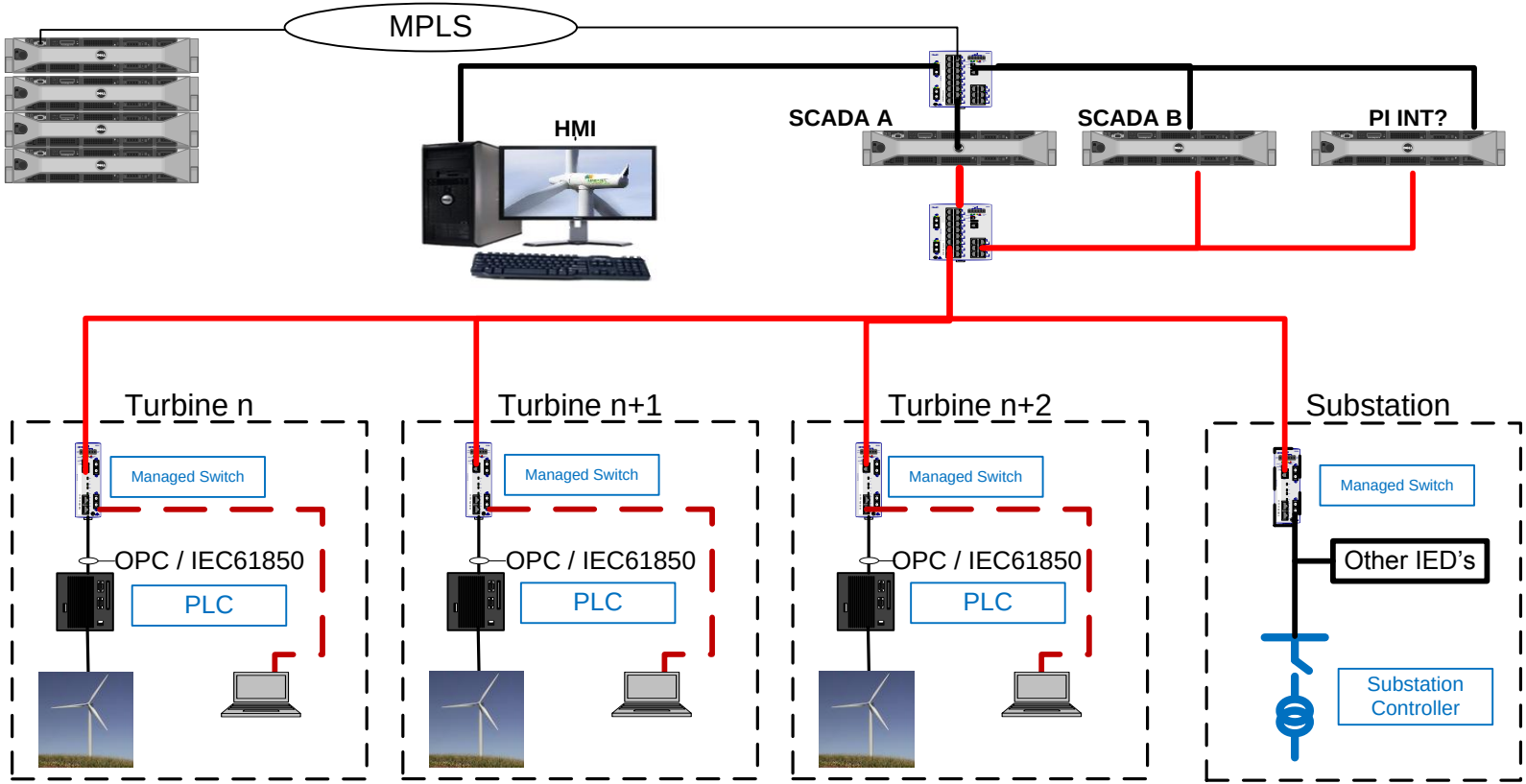
Iberdrola Renewables

- My Role - Director, Wind Operations Systems
- Responsible for data & control of 3444 WTG's
- GE, Gamesa, Suzlon, MHI, Vestas, Siemens
- Iberdrola Renewables (IRI), Implemented an enterprise SCADA system in 2010
- National Control Center – Dispatch & Control
- Staff of 25; Control Engineers, PI Admin(s), PM's, Metering/data, SCADA Engineers/Techs, NERC CIPs.

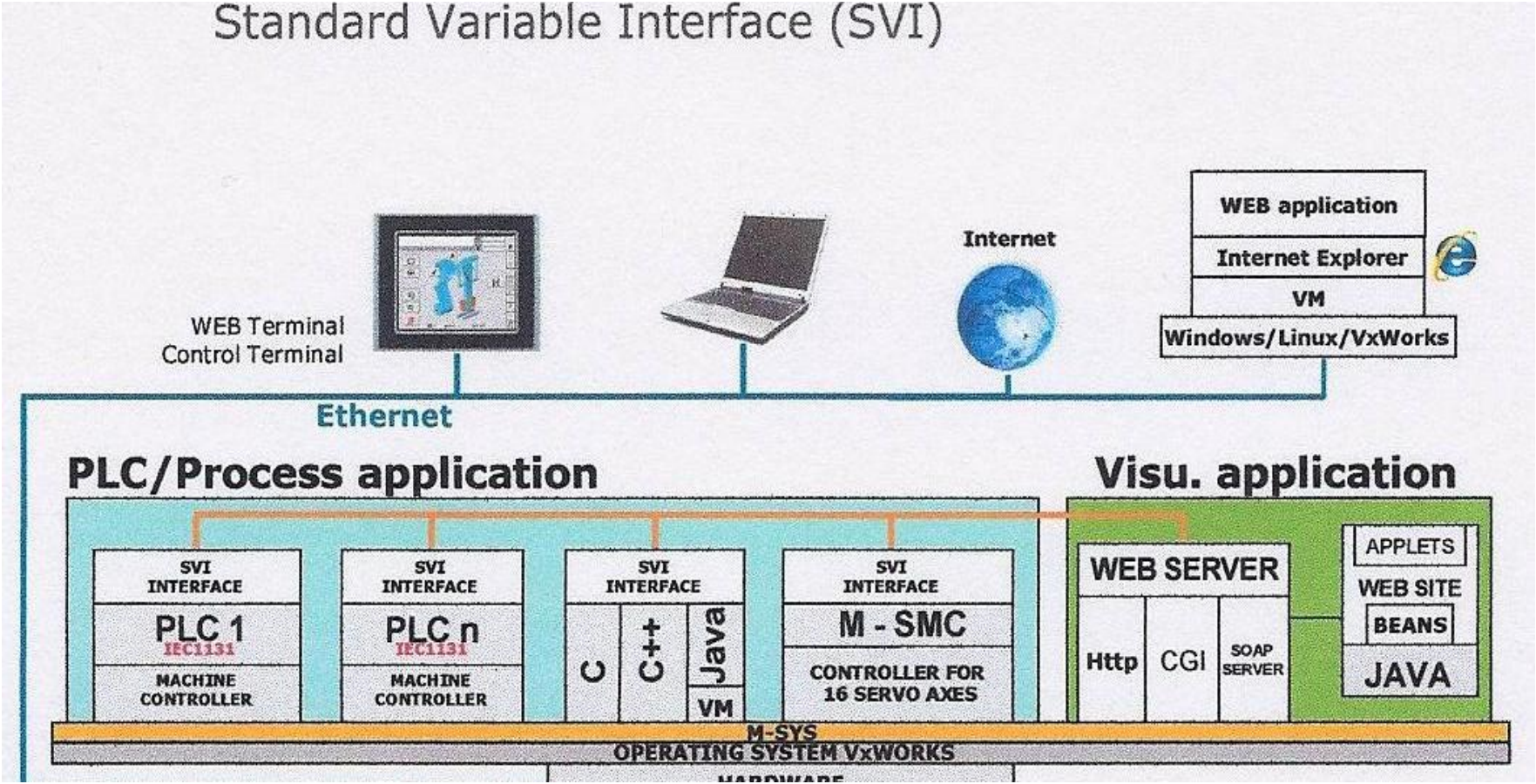
Current Data Structure - Typical



Distributed / Direct Data Structure - Typical



Standard Variable Interface (SVI)



Opinion: Pros/Cons

- Removed layer of complexity - Proprietary nature of Vendor SCADA removed for increased availability.
- Lower maintenance, hardware, configuration, OPC tuning.
- Increased ability to control power, voltage, fault diagnostics.
- No communications delays, direct interaction with turbine controller.
- Data path is distributed – SCADA has Alarm & Control – PI System has historical Data Acquisition

Opinion: Pros/Cons

- Turbine Variable Mapping
- Alarm handling / Subscription vs polling
- Security – Need to control network access
- Development – Need Controller buffering and control of QA/QC commissioning
- May limit access to Hi Resolution data from faults due to proprietary system - Challenge

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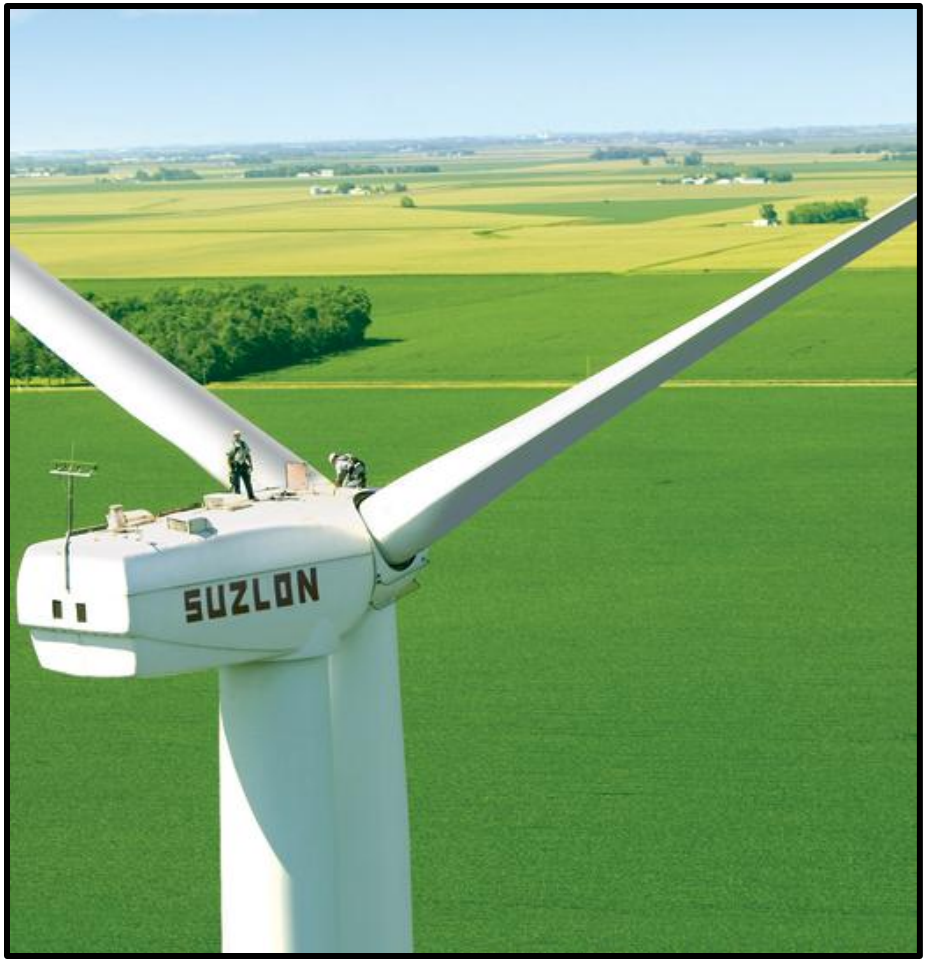
Rick Duesing

Suzlon



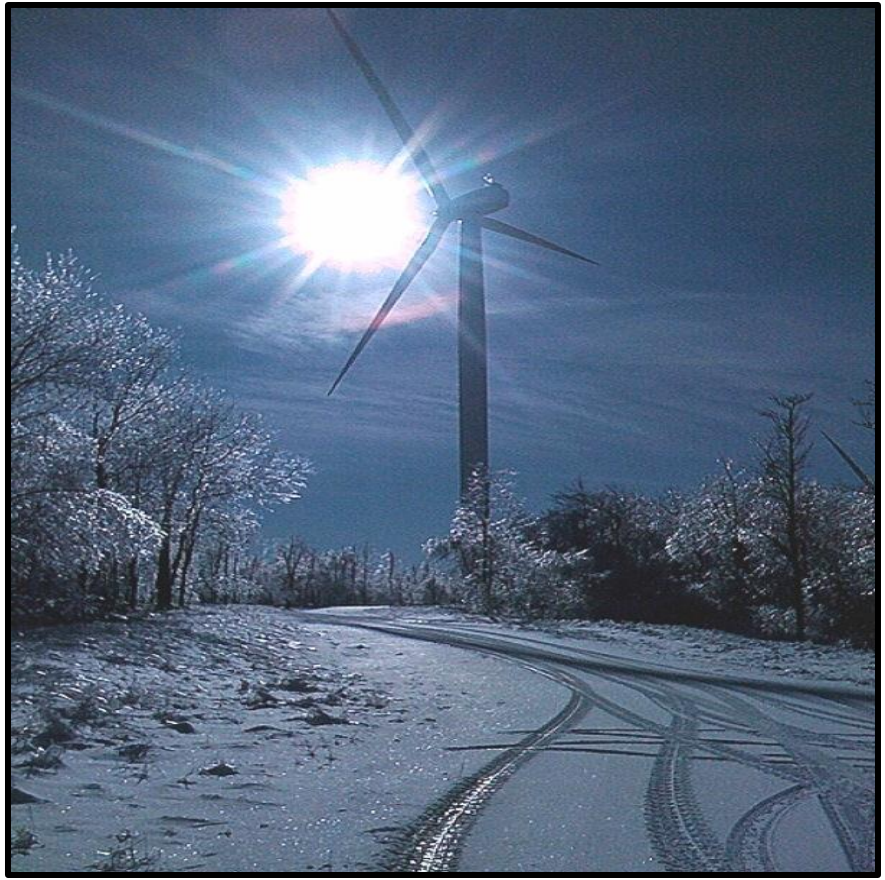
SUZLON

POWERING A GREENER TOMORROW

- Global wind turbine manufacturer
  - Based in Pune, India (est. 1995)
- 3rd Largest OEM in the world
  - Suzlon and REpower combine for 9.8% of world market
- 10,000 MW installed worldwide
- 13,000 employees in 25 countries
- U.S. HQ - Chicago, IL
  - Commissioning, OMS, SCM, Engineering, Special Projects
  - 60+ wind farms in the U.S.
  - 1,257 turbines (S88 & S64)
  - 230+ field technicians

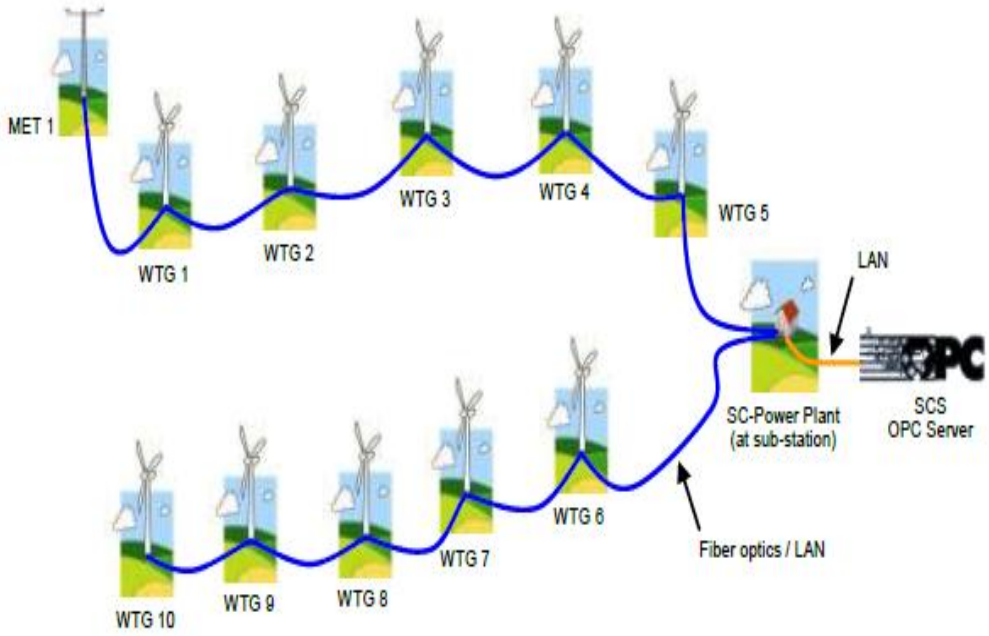
Rick Duesing

- 15+ years in the power generation business
  - **Field service technician**
    - Gas & steam turbine mechanic, WEC
  - **Mechanical engineer**
    - Modifications & Upgrades group, SWPC
  - **RMC manager**
    - RMC co-founder / developer, MPSA
  - **Operations manager**
    - SMC Project Lead, Suzlon
- **Facilities & Powerplant Engineering**
  - Massachusetts Maritime Academy
- **Masters in Business Administration**
  - Rollins College



Current Configuration

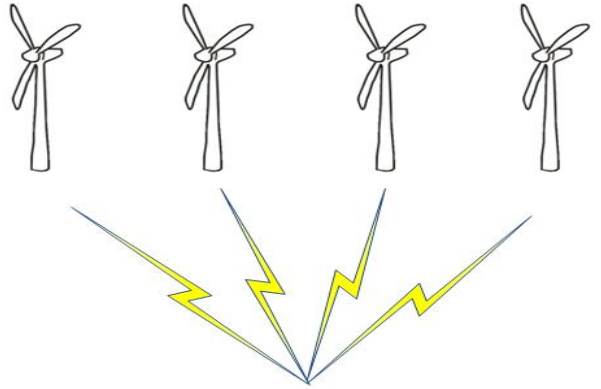
- SC-Power Plant
  - Centralized park master
- Originally designed as a reporting service
  - 92 tags
  - Fast / Slow
  - Analog values only
- Data is stored as 10-minute average
- Data extraction is time-consuming



Our new interface…

- Bachman M1 OPC Server
- Higher tag count
  - 1300+ tags (out of 22,000+)
- All digital inputs / outputs
  - Enables the SMC to dig deeper into root cause
- All parameter set points
  - Warnings & Alarms
  - Configuration Control
- Negligible impact to turbine controllers

Agriwind Site (4 x S88)



Next Steps

- Evaluate new data set and infrastructure
  - Monitor CPU usage
  - Determine broadband (VPN) limitations
  - Build new troubleshooting tools and models
- Retrofit existing PI System sites
- Roll-out w/ all new installations

SUZLON

POWERING A GREENER TOMORROW

Richard.Duesing@Suzlon.com

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Panel Discussion

Thank you

Questions:

- What methods of direct to controller integration would you find important to you?
- CFO Question: What kind of returns do you expect you will achieve by going direct to the controller?
- What incremental cost or savings do you expect by going direct to the controller?
- D2C - Is this a case of 'gather the data' then determine the analytics?
- What improvements to your SCADA data do you expect?
- What is the killer app for this scenario?
- Will this create a 'data asset' that will add value to the equipment?