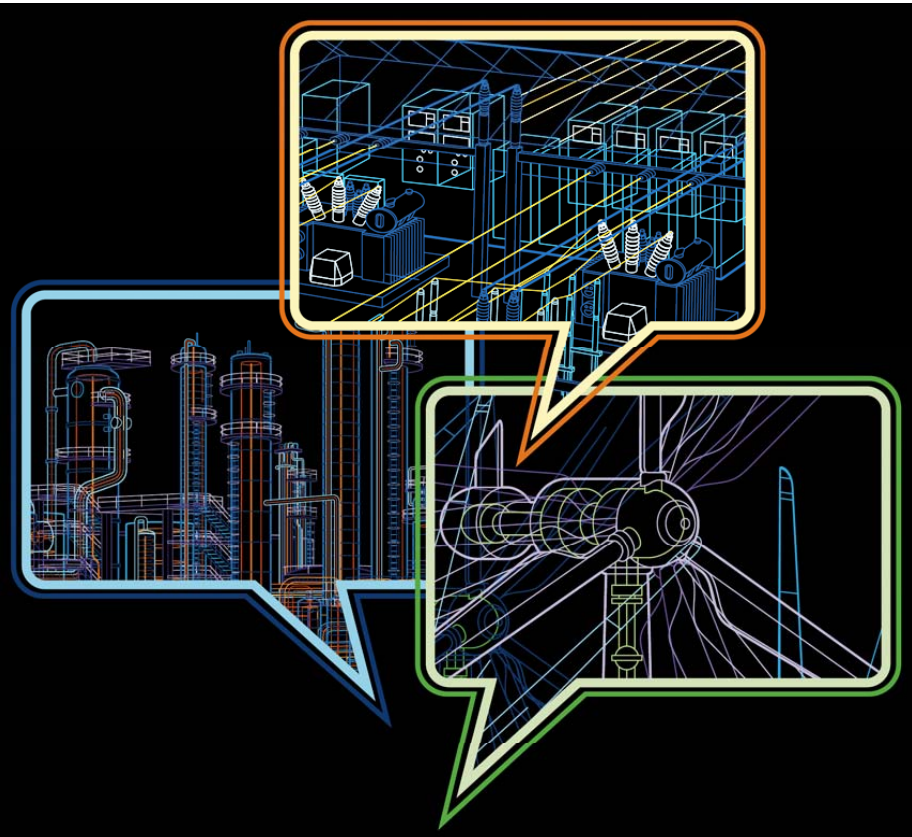
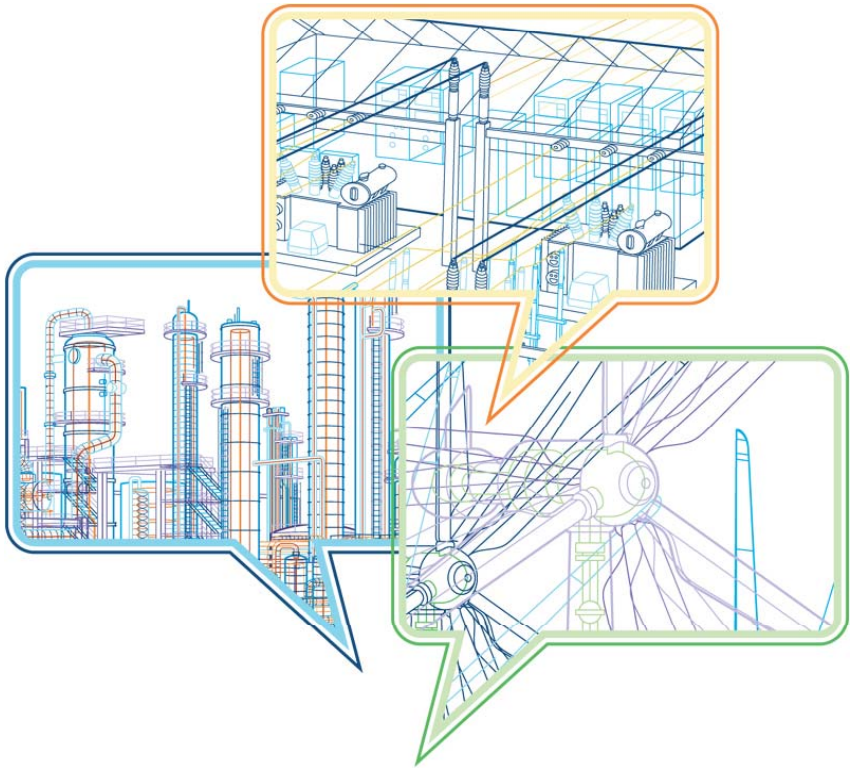


Pre-show Webinar

Automation & Power World 2012
April 23-26 in Houston, TX

Power and productivity for a better world™

ABB Automation & Power World
April 23-26, 2012 in Houston, Texas



Connect. Learn. Succeed.

Save the date for this "must attend" event!

- April 23-26, 2012
- George R. Brown Convention Center in Houston, Texas
- Over 400 hours of educational training
  - Business forum
  - Customer case studies
  - Hands-on training
  - Panel discussions
  - Technical workshops
- Earn PDHs and CEUs
- Technology & Solution Center
  - Over 130,000 sq. ft. of exhibits
- Network with your peers
- **www.abb.com/apworld**

ABB Automation & Power World
At-a-glance

500+

Educational Workshops
Automation & Power World offers over 500 hours of Educational Workshops specifically designed to make engineers, maintenance and management more valuable to their companies.

130K

Technology & Solution Center
Over 1 ½ acres (130,000 ft^2) of with nearly100 tons of electrical gear and 100's of experts ready to answer any of your questions and share the future of Automation & Power Solutions.

4,000

Connect with Peers
With over 4,000 of your peers in attendance, this is a powerful opportunity to network and learn from the industry. In addition, over 65 customers will be sharing their own case studies.

Educational workshops developed for all audiences
Just a few examples

Roles

- Engineering
- Management
- Maintenance

Company types

- Industrials
- EPCs
- Utilities
- OEMs

- Cyber Security: perspective on what works and what's wrong
- ACS550 AC Drive configuration: Hands-on experience
- Switching megawatts: The latest in medium voltage drive semicondutor technology
- Fifteen years of operation at NASA's National Transonic Facility with the world's largest drive
- Utility demand reduction with a cost effective and reliable energy storage system: a case study
- Asset Health: Next generation maintenance management strategies and tools
- Robotics 101
- SF6 leak mitigation through design, manufacturing and integrated monitoring
- Nuclear Plant improvement with main generator output circuit breaker repair and replacement
- Improve Oil & Gas operations through collaboration and attention to human factors

Past attendees input

"It’s the best display of product and expertise in a convention that I have ever seen; it’s well worth attending."

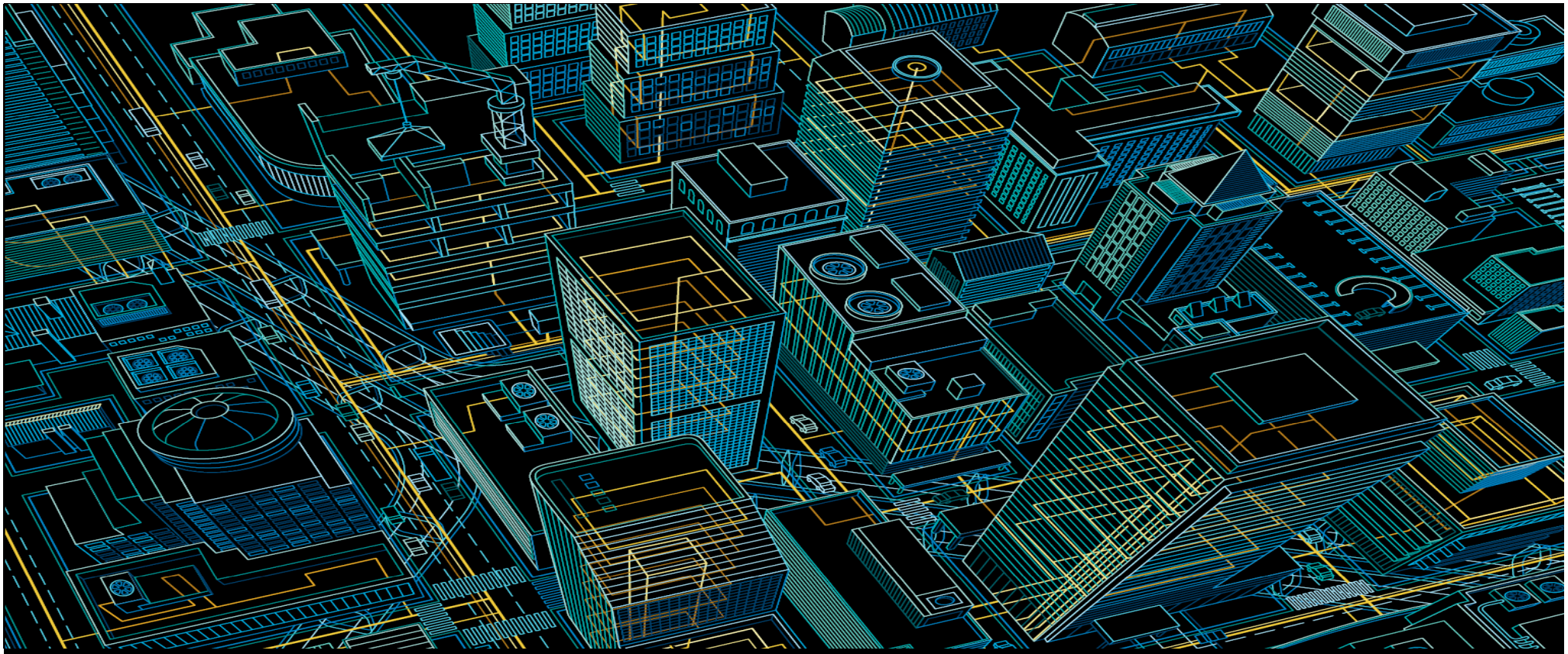
Kevin Ryan, Mathews Company

"Largest collection of experts and technology under one roof."

Jeff Brown, Alcoa

"The product selection for this company is huge. The technical sessions that we attend are just fantastic, and we really get a lot out of it to take home."

George Sydnor, NASA



Alejandro Schnakofsky, ABB Substation Automation Products, 03-08-2012

How communications is driving the integration of IT, engineering and operations

Overview

- Utility structure and how it has evolved with technology
- Substation Automation and Protection and why different groups are involved
- Ethernet… routable messages in the office and inside the substation
- Utilization of information in operations and engineering
- System architecture and security, avoid unknown routes to your real time control systems
- IEC 61850 as a catalyst for this utilization
  - Standard modeling of apparatus and status points makes the mapping of protocol data into meaning full application data easy
  - Seamless integration

The Players

Operations

Communications

System Protection

Control

IT

Telemetry

The Goals

Comply to regulations

Increase reliability

Increase up time

Modernize

Become more efficient

Improve system awareness

How to achieve them?

Many of the initiatives that drive organizations towards achieving the afore mentioned goals involve one very important element…

Communications

How technology drives the structure

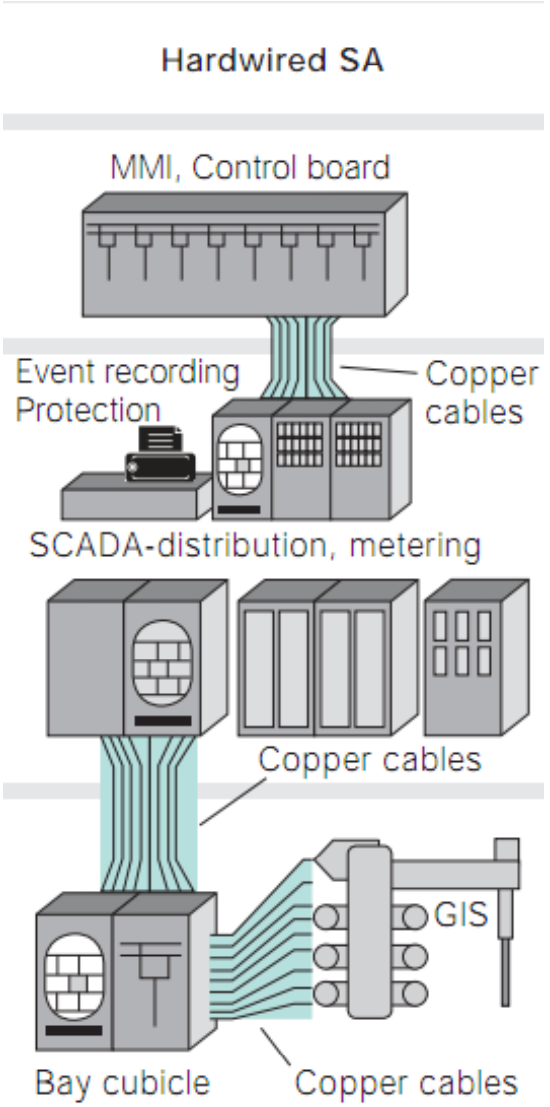
- It used to be that these where separate entities:
  - Utility communications
  - Telemetry
  - System Protection
  - Control

How technology drives the structure

- Utility Communications
  - Substation to Substation communication
  - Substation to Network Control Center communication
  - Teleprotection equipment

How technology drives the structure

- Telemetry
  - Status of system to SCADA



How technology drives the structure

- System Protection
  - Short Circuit protection
  - Apparatus protection
  - Availability of service
  - Automation

How technology drives the structure

- Control
  - Interlocking
  - Operation of
    - Breakers
    - Tap changers

How technology drives the structure

- Newer technologies have pushed the consolidation of functions
  - Ethernet
  - Micro processor
  - Standardized protocols

How technology drives the structure

- Protection and Control
- Marriage of two functions thanks to the evolution of the microprocessor relay
- IO capability
- Communication capability

How technology drives the structure

- Telemetry and Control (sometimes also including Utility Communications)
- Microprocessor relay / RTUs
- Communication capability
- Standard protocols

How technology drives the structure

- With the interconnection of equipment and newly created availability of information
  - SCADA
  - Remote monitoring and retrieval of information
  - Remote operation of system
  - Asset management
  - Integration of data into EMS

Field Process Data

IT

EMS / Office

How technology drives the structure

Field Process Data

- How is the information obtained and divulged?
- Who has responsibility for making information available?

Communications
Control
Telemetry
System Protection

EMS / Office IT

- Impact of additional assets
- Addressing
- Cybersecurity
- Administration
  - Patches/maintenance
  - Access

Coordination

Field Process Data

IT

EMS / Office

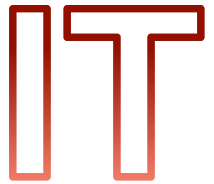
Communication is unleashing possibilities but for visions to materialize:

- Selected technologies/equipment must fulfill the requirements of all stakeholders
- Synergy must exist among different groups to select the proper technologies and equipment
  - Requirements
  - Smart compromises

Current trends - Cyber Security

- Cyber security has become an issue **by introducing Ethernet (TCP/IP) based communication protocols** to industrial automation and control systems. e.g. IEC60870-5-104, DNP 3.0 via TCP/IP or IEC61850
- **Connections to and from external networks** (e.g. office intranet) to industrial automation and control systems have opened systems and can be misused for cyber attacks.
- **Cyber attacks on industrial automation and control systems are real and increasing**, leading to large financial losses
- **Utilities need to avoid liability** due to non-compliance with regulatory directives or industry best practices;

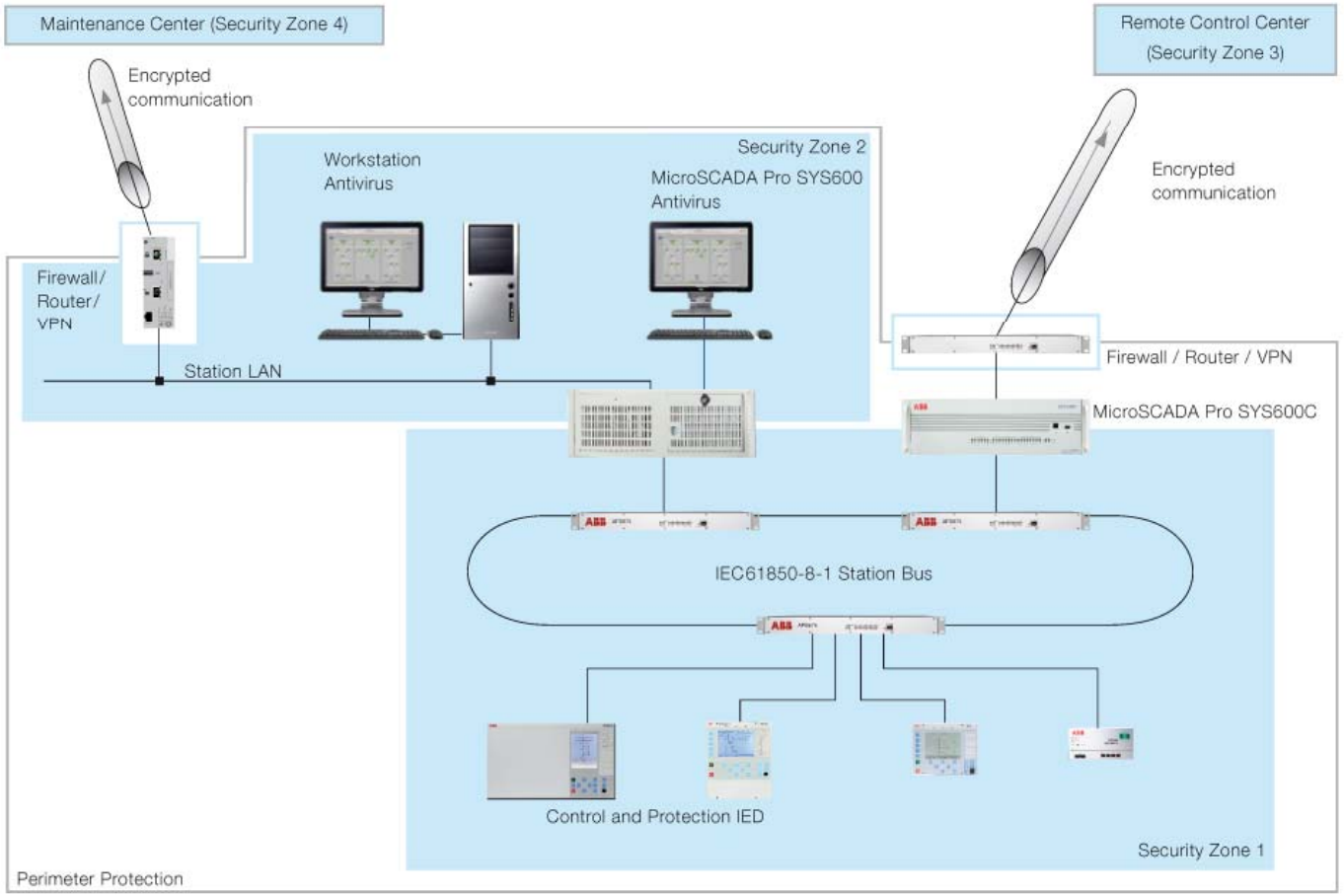
Cyber Security



- The selection criteria of substation control, protection, and communication equipment evolves to include cyber security
- In depth knowledge of cyber security regulations, trends, and best practices may be scarce outside IT
- Include IT evaluation as part of equipment selection process to cover all basis and ensure the selected equipment will meet the company's cyber security plan

Cyber Security

- Ultimately Cyber Security and compliance to regulations is not a device level issue but a system one
- System architecture, processes, and best practices must be deployed and coordinated



Current trends – IEC 61850

- Communication Protocol
- Substation information model
- Specification for communication equipment inside substations
- Testing ensuring interoperability

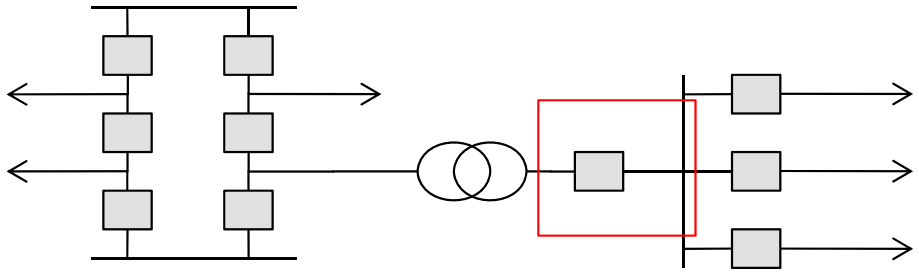
IEC 61850

- Protection Applications – GOOSE and SMV
- Control/Telemetry Applications – Client Server
- Integration of information into EMS – Standard data model
- Interoperability of equipment from different manufacturers

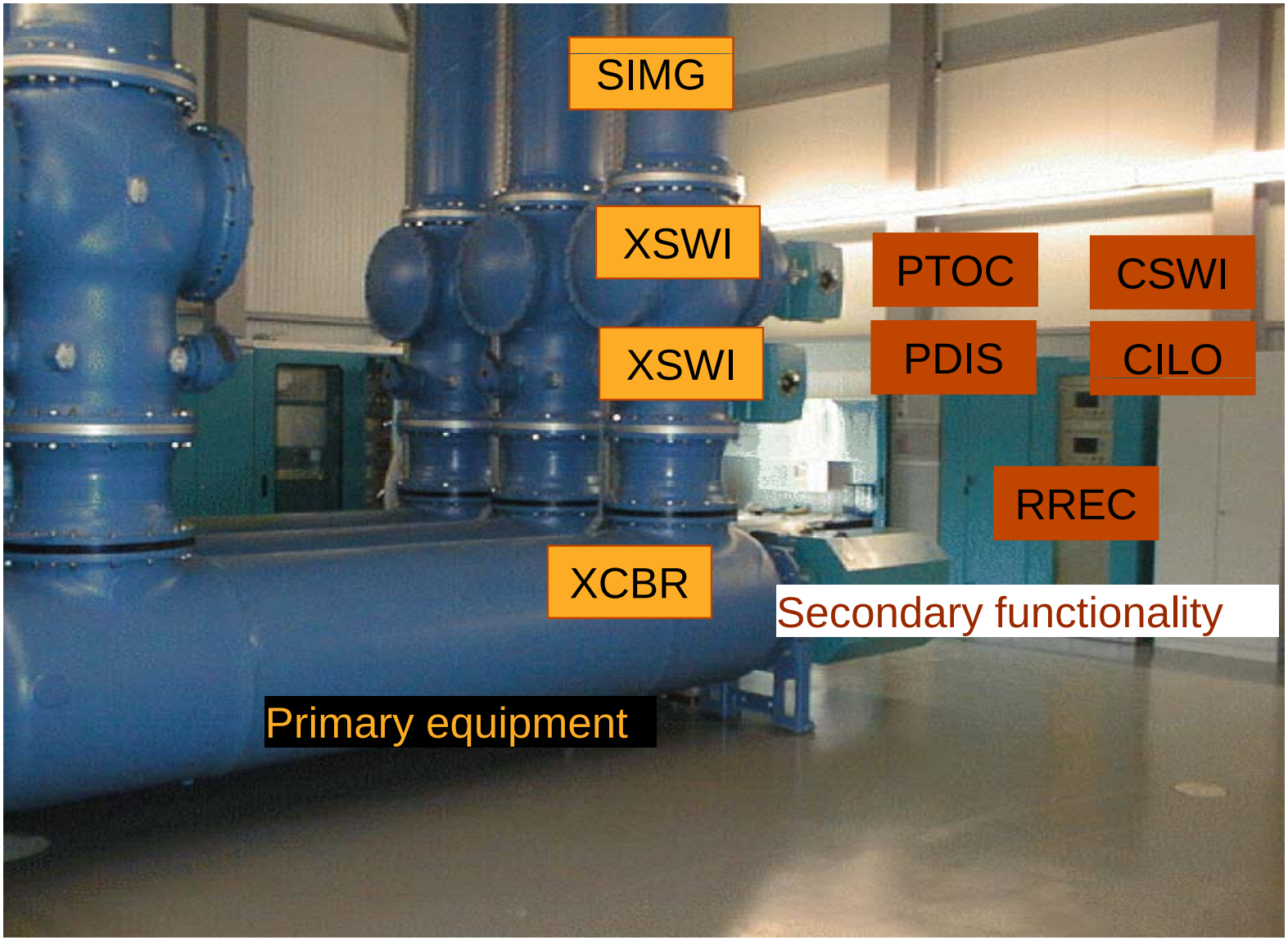
Data model

- 61850 helps by standardizing the representation of function/equipment, their data attributes, and location within the system

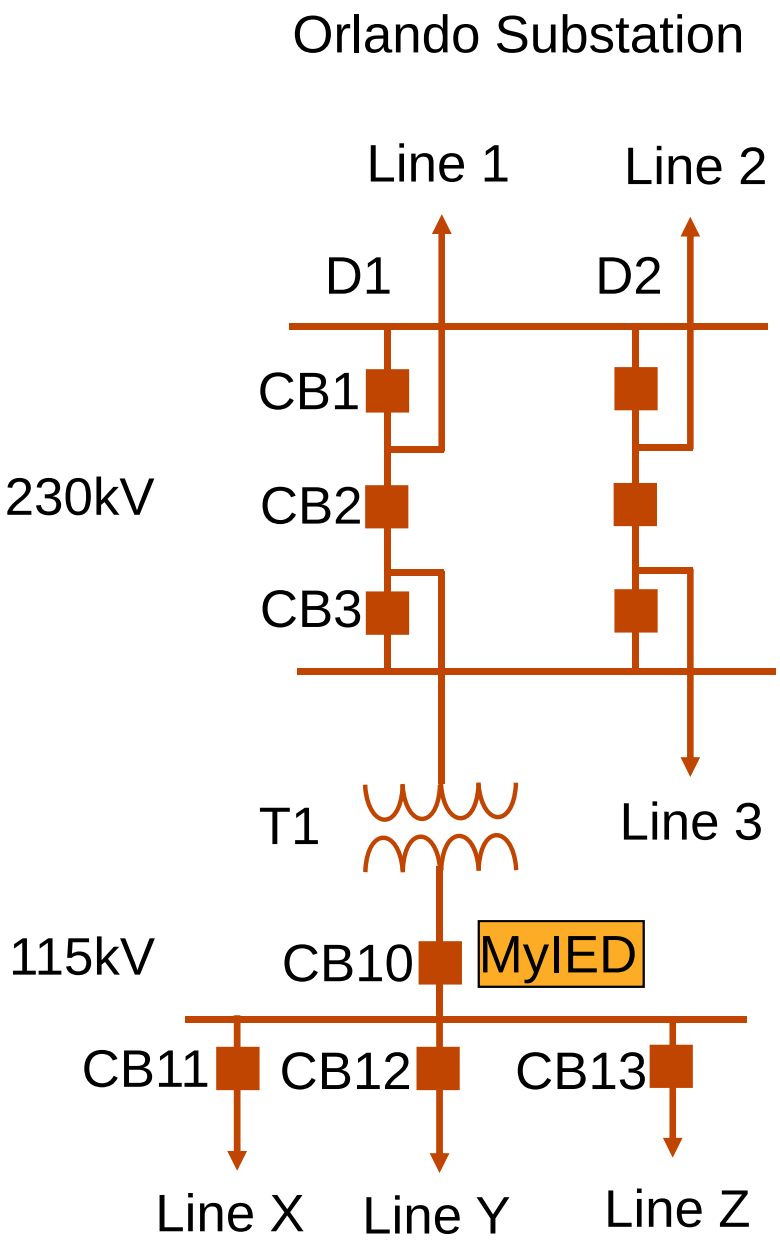
Function / Equipment	LOGICAL NODE
Position of Breaker1	Breaker = XCBR
52A = Device 5, BI #4	Position = XCBR.Pos.stVal
52B = Device 5, BI #5	Measurements = MMXU
Breaker1 Current	Current PhA = MMXU.A.phsA
PhA = Device 5, AI #10	Current PhB = MMXU.A.phsB
PhB = Device 5, AI #11	Current PhC = MMXU.A.phsC
PhC = Device 5, AI 12	51P Target
Breaker 1 51P and 50P targets	51P = PTOC.Op.general
51P = Device 5, BI #6	50P = PIOC.Op.general
50P = Device 5, BI #7	

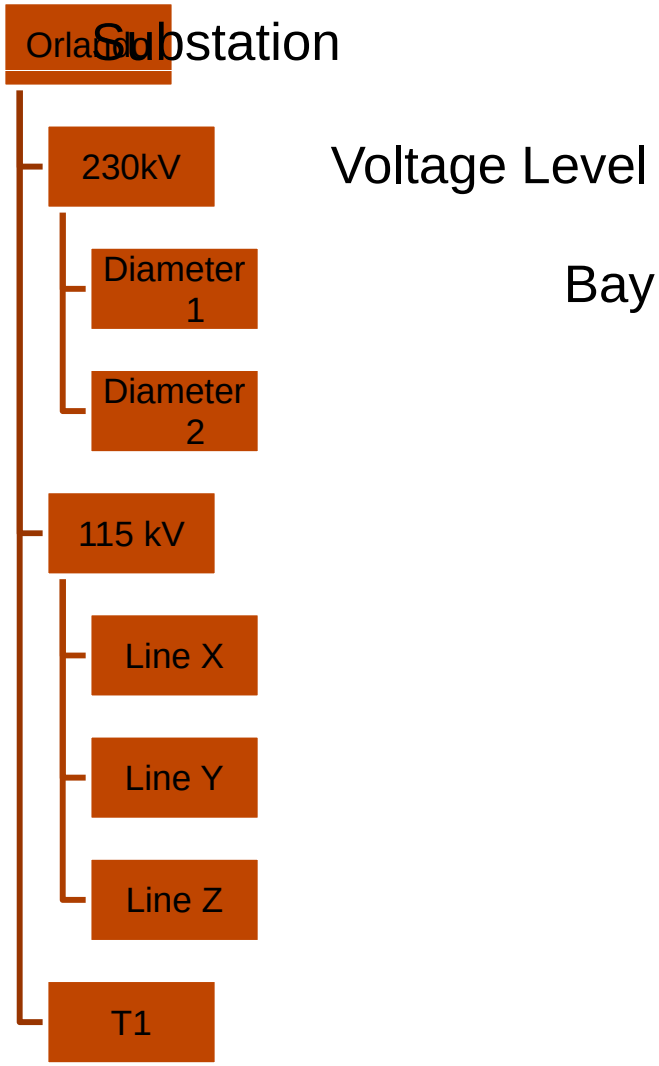


Logical nodes



Modeling – Substation structure





Proposed approach

- Design with cyber security in mind
- Involve domain experts (IT)
- When 2 or more functions converge in a particular piece of equipment ensure such equipment meets the needs of all stake holders
- Ensure a sound and secure communication architecture (no backdoor entries)
- Ensure functionality and interoperability by utilizing open standard protocols such as IEC 61850
- Understand applications, information needed by EMS and how SA can service

Power and productivity
for a better world™

Automation & Power World 2012
April 23-26, 2012 in Houston, TX

Past attendees input

"I’ve attended Automation & Power World for eight straight years. What brings me back is the workshops, the people, everything."

Stephen Deschamps, NOVA Chemical

“What a tremendous value for all you get in a short time.”

Rory Johnson, Weyerhaeuser Co.

“The way that ABB combines automation and power into one event has been very beneficial.”

Caroline Dayyani, Spectra Energy

Workshop Statistics
Over 500 hours of training

- ~65 customer presented case studies
- 87 sessions in the Technology and Solution Center
- 11 hours of panel discussions consisting of customers, industry experts and ABB executives
- Over 50 hours of hands on Technical Training

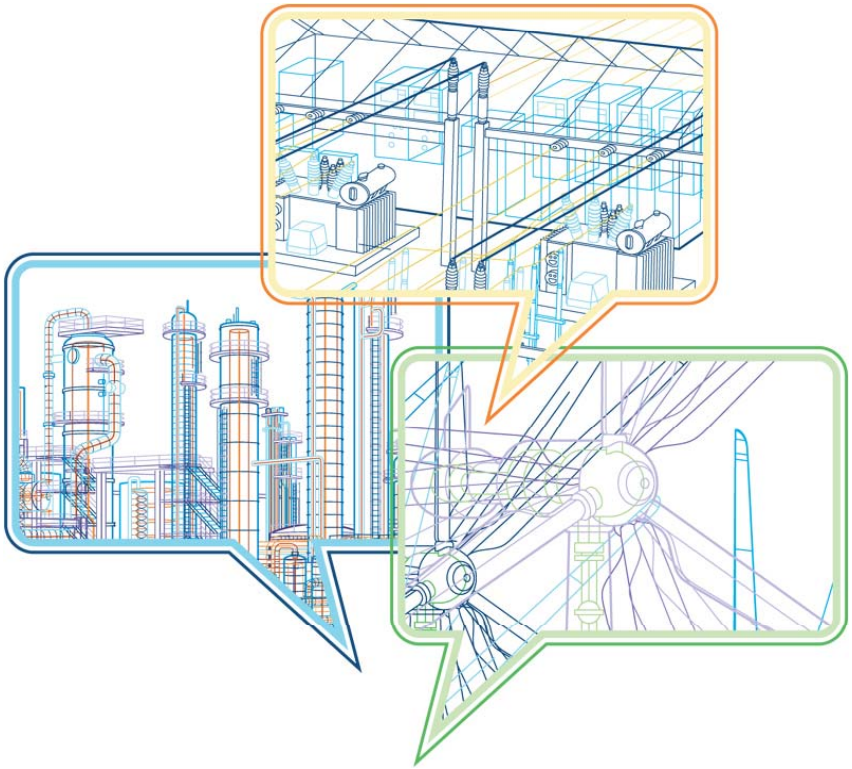
ABB Automation & Power World
Registration options

	Monday program (1/2 day)	Daily and Full Conference program	One Day Courtesy program
Access to ABB product developers and application experts in the 130,000 ft² Technology & Solution Center—incl. lunch!	✓	✓	✓
Access to a series of complimentary and educational workshops.	✓	✓	✓
Access to hundreds of additional educational workshops, customer case studies, and panel discussions	✓	✓	
Access to General Sessions		✓	
Access to the Business Forum (M/W)		✓	
All conference meals and evening events	✓	✓	
Evening Events (Monday and Wednesday)	✓	✓	
Cost	$100	$300 per day or $900 for Full Conference (includes Monday)	No charge

Top ten reasons to attend

1. Become more valuable, choose from hundreds of educational workshops, panel discussions and hands-on training sessions
2. Connect with thousands of peers and industry experts from 40 countries
3. Ask questions of, and give feedback to, ABB product developers and executive management
4. Get up to date with new and emerging technologies and industry trends
5. Learn how to maximize the value from your existing assets
6. Discover how to improve grid reliability, energy efficiency and industrial productivity
7. Apply lessons learned from customer-presented case studies
8. Focus on critical non-technical issues facing your company in the business forums
9. Succeed professionally by earning CEUs on select workshops and PDHs for every workshop you attend
10. See the widest range of technologies from one company at one conference!

Automation & Power World 2012
April 23-26, 2012 in Houston, TX



Register today!

www.abb.com/apworld

Join the Automation & Power conversation:
Stay in the loop:

Power and productivity
for a better world™