Digitisation of Power Distribution
Design for outcomes

#DigitalEvolution
#InnovationDay
#EcoStruxure
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Power Distribution is going through a paradigm shift as the world gets more digital.

**Always On**
- 100% Uptime
- The digital economy demands always-on power

**Digitized**
- 75%
- Digital generation to be 75% of workforce by 2025
- 10x
- More connected devices than people by 2025

**Decentralized**
- 70%
- 70% of new energy production capacity will be renewable by 2040
Large power consumers and critical facilities are the most impacted...
...and the implications are real.

- 22% of fires in a facility are due to electrical failures, and 50% of electrocutions occur within facilities.
- Power interruptions cost the US economy $110 billion per year.
- There is a 15% potential reduction in project costs during the CAPEX phase of a project.
- 70% of Power Quality disturbances originate within facilities leading to 30-40% of downtime incidents.
- There is an average 10% potential reduction in energy cost in critical facilities and an additional 15% savings in maintenance OPEX.
- Compliance to energy efficiency standards can improve energy intensity by up to 10% and add up to a 15% premium in building price.
Leverage digitization to revolutionize how we build facilities…

- FASTER
- SIMPLER
- COMPLIANT

- Save Time and Money in Design & Engineering
- Reduce Risk and Ensure Future Ready Design
- Comply with Standards & Best Practices
- Simplify Install & Commissioning
…to turn power systems into an asset for businesses, not simply a cost..

SAFE  RELIABLE  EFFICIENT

Avoid Electrical Fires and Ensure Protection
Avoid Downtime by Preventing Power Failures
Recover from an Outage and Restore Power Safely
Increase Electrical System & Asset Reliability
Save Money by Reducing Energy Spend & Maintenance
Maintain Compliance to Regulations and Sustainability
Translating the data deluge into meaningful insights
Context that drives business value

CLOSE THE LOOP

CONNECT
Connect everything from shop floor to top floor

COLLECT
Capture critical data at every level, from sensor to cloud

ANALYZE
Convert data into meaningful insights

TAKE ACTION
Drive action through real-time information and business logic
EcoStruxure Power Connected Electrical Distribution Architecture

- **Apps, Analytics & Services**
  - EcoStruxure Advisor Services (cloud hosted expert services & analytics engines)

- **Edge Control**
  - EcoStruxure Power Management (information visualization on premise)

- **Connected Products**
  - MV Smart Panels
  - Power Quality
  - LV Smart Panels
  - Breakers
  - Relays / RTUs
Primary needs of electrical distribution systems

SAFETY
- PEOPLE, ASSETS
  - FIRE PREVENTION
  - INSULATION MONITORING

RELIABILITY
- CONTINUITY OF SERVICE
  - CAPACITY MANAGEMENT
  - BACK-UP POWER TESTING
  - MONITORING & ALARMING

EFFICIENCY
- ENERGY CONSUMPTION, MAINTENANCE
  - COST ALLOCATION
  - BENCHMARKING
  - ASSET PERFORMANCE
Begin with the end in mind

Challenges:
Achieve desired outcomes, Design for the future, Reduce project execution risk

Product approach

Applications approach
Think systems, design systems, buy systems.

**Industrial Plant**

**Needs**
- 24/7 Production
- High Output
- Easy Operation
- ISO certification
- Reduce Cost
- Low Maintenance

**Supporting Infrastructure**
- Fire & Safety
- Security
- IT Systems
- HVAC
- Lighting
- Electrical

They Need This

They Buy This
Think system, design systems, buy systems.
Digital power distribution design. Time for change.

Applications approach

Customer Need  Digital Application  Digital Architecture

“I want to find issues before they turn into problems so that I can avoid the cost and stress of power disruptions.”

Asset Performance
Proven architectures help optimize **Financial Health, People Safety and Operational Efficiency** according to Standards and Regulations.

Implement solutions that will help you simplify regulatory compliance and conform with relevant standards, now and in the future.

- **Standards, Regulatory Compliance**
  - IEC Standard recommendations
  - ANSI Standard recommendations

- **ED Reference Architectures**
  - Reference IEC Power Architecture
  - Reference ANSI Power Architecture

- **Solutions Specifications & Prescriptions**
  - Design brief and Specification
  - Design tools
  - Cyber Security

Summary of architectures documentation, along with summaries of other technical systems.
Continuous Thermal Monitoring

Reduce risks of electrical fires and improve people protection
Traditional Methods for Fire Risk Mitigation: Thermal scanning

Manual and potentially erroneous

- Periodic, infrared scanning of ‘hot points’
- 1-2 times per year
- Require onsite presence of qualified contractor
- Performed on open/energized equipment
- High probability of inaccurate results – transient results, inaccessible areas, etc
EcoStruxure Power - Continuous Thermal Monitoring solution

- 24/7 monitoring and alarming
- Absolute temperature
- Temperature difference between phases
Don’t forget about Cybersecurity!
Cybersecurity is an upfront design topic, not an afterthought
60% of the threat comes from insiders

**Insiders**
Disgruntled employees, 3rd parties with access

**Outsiders**
Criminals, governments, activists, researchers, etc.
Bring in our experts to help “design” Cybersecurity

- Global network of ISA/IEC 62443 certified engineers
- Team of certified engineers in Australia (Fundamentals and Expert levels)
Leverage an Ecosystem of Digital Partners to support customers
EcoStruxure Power systems are used around the world

Trusted by leading players worldwide

- Proven electrical distribution and power management expertise delivering best-in-class solutions
- Scalable, open, and secure power IoT platform
- 170+ years of energy innovation
- A global presence with local teams in more than 100 countries

Nemours Children’s Hospital, USA
Help provide patient safety through highly reliable power

Oracle, USA
Software giant achieves high-quality power with fast payback

Melbourne Cricket Ground, Aus.
Power management and lighting automation system ensures sustainability

Geneva Airport, Switzerland
Modernizing the airport’s entire electrical distribution system without delays.

Smith & Nephew, USA
Power monitoring reveals additional capacity to support new loads

Sappi Paper Mill, Belgium
Improving site planning and operational ability
Going forth…

1) What are the key challenges that we face today in the electrical distribution networks?
2) How do we address these challenges better by leveraging digital solutions?
3) How do you recommend to deploy these digital solutions in your facilities or projects?
4) Is the industry fluent enough to make the most of the digital technologies? If so, how do you recommend to improve it further?
5) Is the industry informed enough about cybersecurity risks associated with IT/OT convergence? If not, how would you approach this topic in your current facility / project?
6) How would you reduce risks associated with integration of digital technologies in your electrical infrastructure?
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