

EFFICIENCY

EcoStruxure Power for Oil & Gas and
Petrochemicals – Essential Applications



Life Is On

Schneider
Electric

se.com/ecostruxure-power

Thrive in a digital world

At Schneider Electric™, we embrace the digital revolution and its potential for positive change.

We envision a world where staff and occupants are safer, with zero electrical safety incidents; where power is 100% available, with zero unplanned downtime; where energy and operations are more efficient, with zero energy waste; and where operational systems are resilient, with zero cyber intrusions.

We strive to make this vision a reality with EcoStruxure™ Power, our IoT-enabled architecture and platform that empowers sustainable operations.

Oil & Gas and Petrochemicals industry is facing significant challenges

As our world becomes more digital and more electric, industrial facilities are challenged like never before. Specific issues include:

Project delays

Pressure on CapEx

On-site safety

Operations continuity

Sustainable operations

Your power system: key questions to ask

- How can I secure the project planning when the power system is on the critical path?
- Is my power system optimized for size and use? Does it leverage all energy savings and optimization capacities? Is it properly integrated with your process control system?
- Is my power system sufficiently reliable, safe, and cybersecure? Can you manage it with the support of analytics and artificial intelligence?
- Does my system have built-in sustainability features, to leverage renewable generation and to reduce GHG emissions?
- Is there a strategy to gradually enable unmanned operations?

Embrace the digital-electric future

Today's energy evolution demands that oil & gas and petrochemicals industry reconsider their operational and business requirements:

- Keeping staff safe is a priority that cannot be compromised.
- Business continuity is equally important; outages reduce profitability and can threaten an enterprise's very existence.
- An environmentally conscious public expects — or even demands — energy efficiency and sustainability initiatives.
- Safeguarding operations from cybercrime demands continued vigilance.

Addressing these challenges requires a transformation of the electrical distribution that powers infrastructure.



Digital intelligence for smarter investments and operations

EcoStruxure Power applications achieve real business results, with IoT transcending technology to deliver valuable and ongoing business outcomes.

Save time and money

Conserve resources with faster pre-feed, feed, design, and commissioning.

Comply with standards and best practices

Reduce cyber risk and ensure future-ready design.

Enhance people safety and help avoid downtime

Enhance safety for personnel and optimize continuous operations.

Enhance efficiency and sustainability of operations

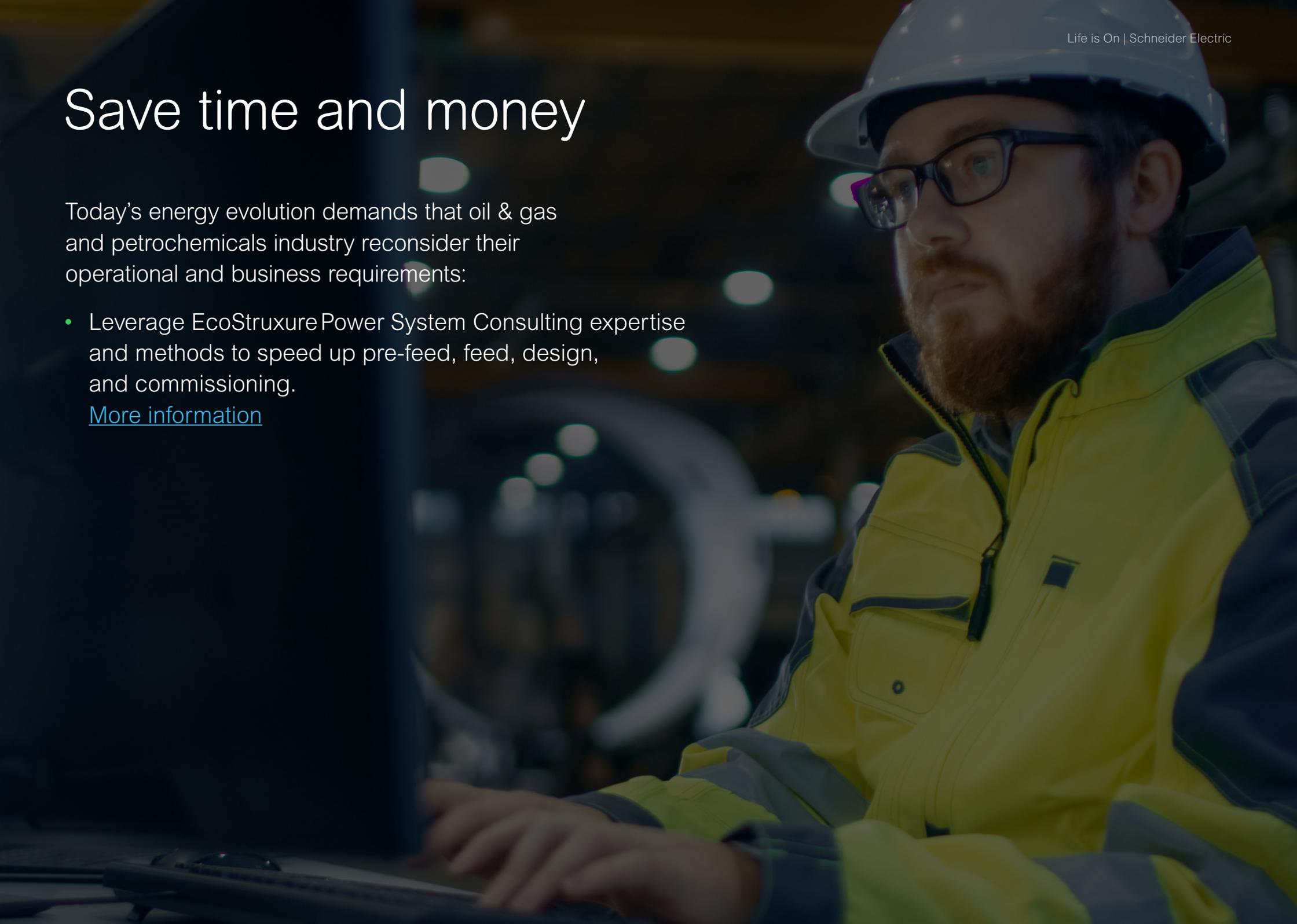
See efficient operations and maintenance, and reduce carbon footprint.

Save time and money

Today's energy evolution demands that oil & gas and petrochemicals industry reconsider their operational and business requirements:

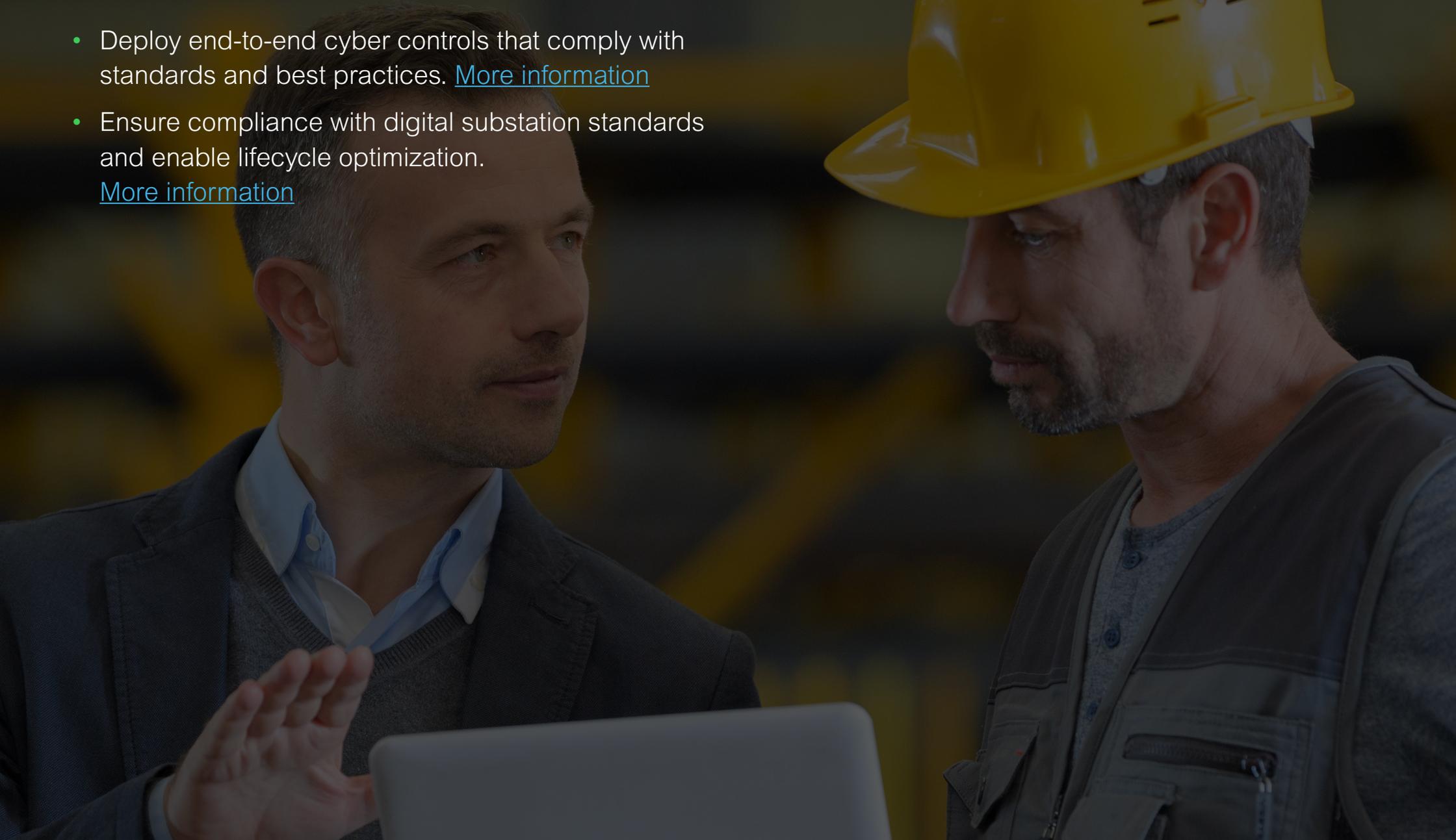
- Leverage EcoStruxure Power System Consulting expertise and methods to speed up pre-feed, feed, design, and commissioning.

[More information](#)



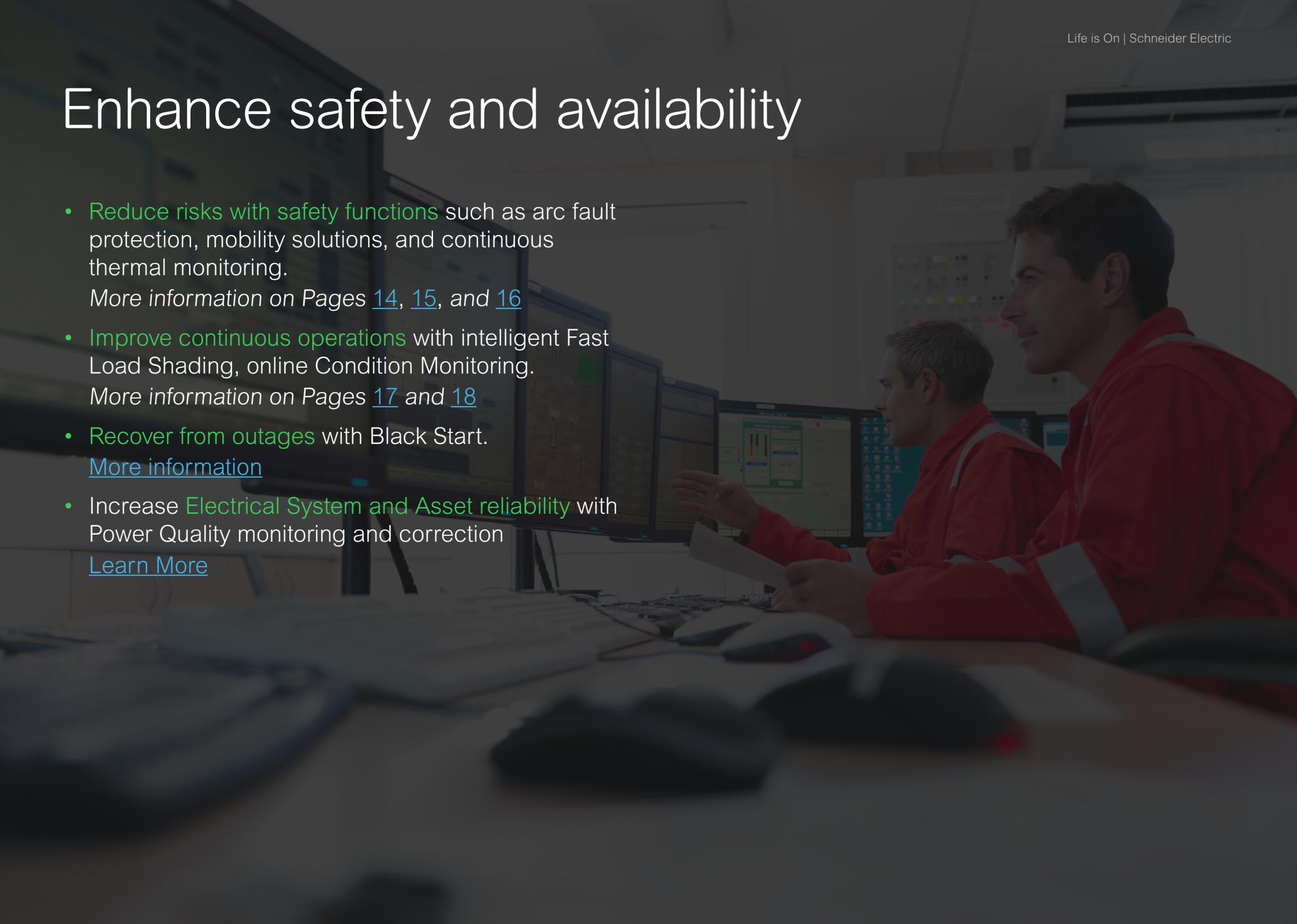
Comply with standards and best practices

- Deploy end-to-end cyber controls that comply with standards and best practices. [More information](#)
- Ensure compliance with digital substation standards and enable lifecycle optimization. [More information](#)



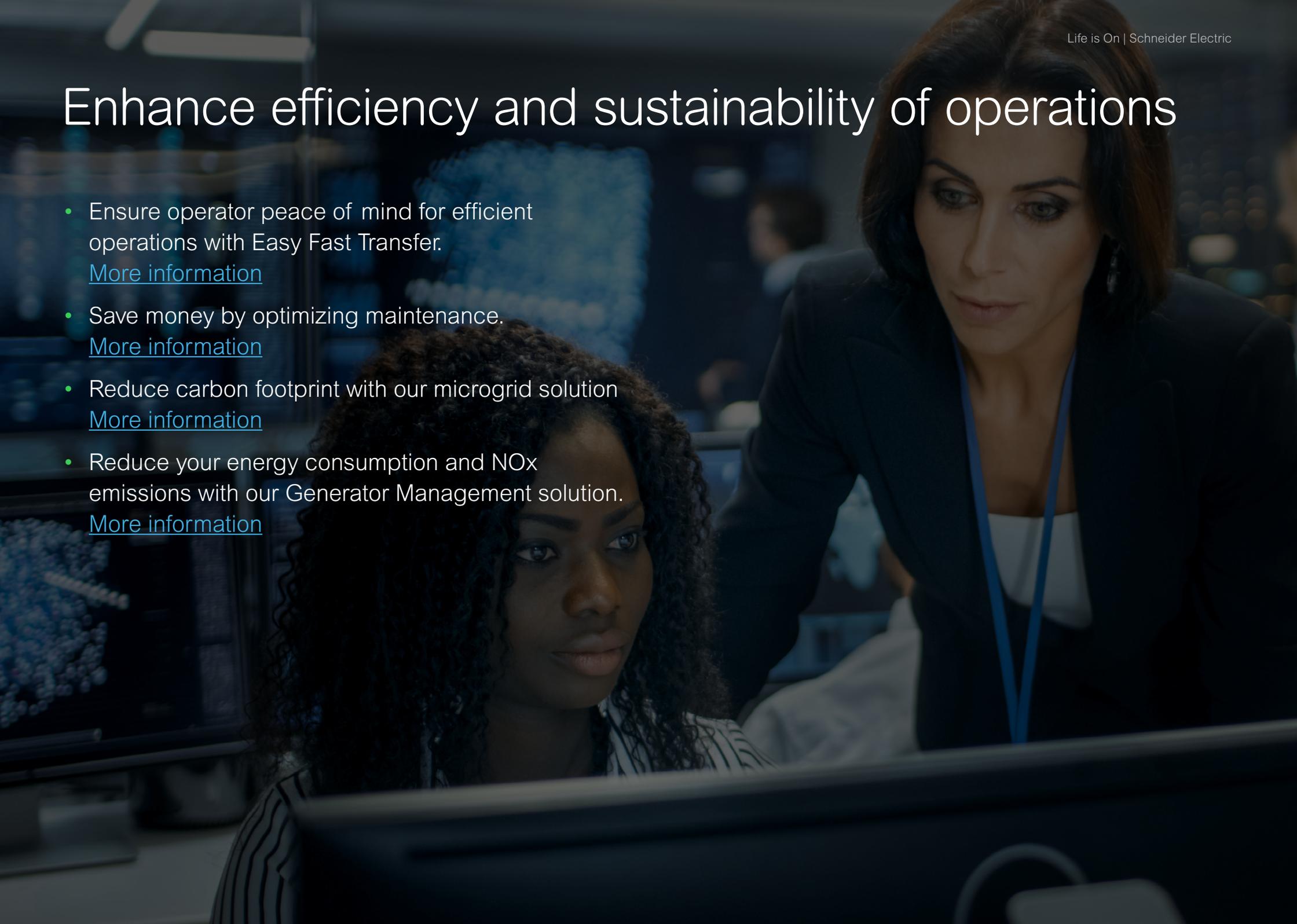
Enhance safety and availability

- **Reduce risks with safety functions** such as arc fault protection, mobility solutions, and continuous thermal monitoring.
More information on Pages [14](#), [15](#), and [16](#)
- **Improve continuous operations** with intelligent Fast Load Shading, online Condition Monitoring.
More information on Pages [17](#) and [18](#)
- **Recover from outages** with Black Start.
[More information](#)
- Increase **Electrical System and Asset reliability** with Power Quality monitoring and correction
[Learn More](#)



Enhance efficiency and sustainability of operations

- Ensure operator peace of mind for efficient operations with Easy Fast Transfer.
[More information](#)
- Save money by optimizing maintenance.
[More information](#)
- Reduce carbon footprint with our microgrid solution
[More information](#)
- Reduce your energy consumption and NOx emissions with our Generator Management solution.
[More information](#)



EcoStruxure Power system consulting

Reduce your planning risk, optimize your CapEx footprint.

Our experts help you:

- Redefine traditional modeling of electrical architectures.
- Optimize generators, transformers, and load management, based on process requirements.
- Consider new strategies to provide fit-to-purpose solutions.
- Anticipate e-house integration constraints.
- Use preconfigured architectures.
- Leverage reference designs for recurrent applications based on context of usage, i.e., load types, operations, size, etc.
- On-line tools help you optimize Motor Management Design for CapEx reduction and OpEx :
 - Optimize conceptual design including starting methods
 - Configure the complete motor control solution
 - Contribute to Generation rightsizing

[More information](#)

Key takeaways

- Reduced engineering and execution planning.
- Up to **20%** cost, weight, and footprint savings on power generation, electrical distribution equipment, and cabling — plus the associated impact savings over the asset's lifetime.

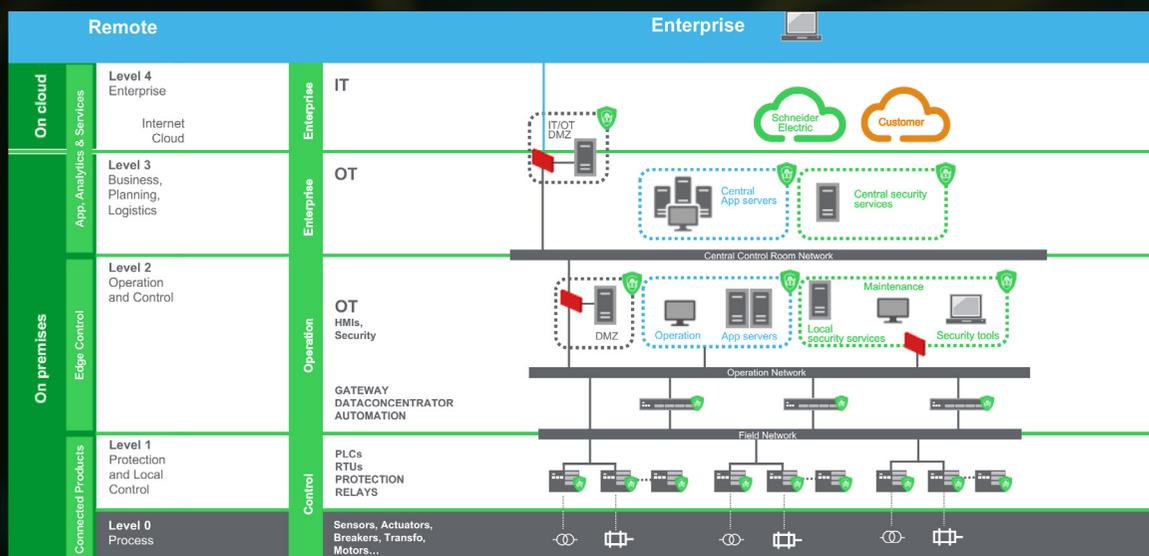
Cybersecurity

Comply with standards and best practices.

- IEC 62443 3-3 compliant.
- Reduce risk with best practices and technical features such as active directory integration and multi-factor authentication.
- Provide global cybersecurity expertise tailored to local requirements.

Key takeaways

- Risk mitigation
- Compliance to standards



Energy management control systems (EMCS)

Comply with standards and best practices.

- Comply with relevant digital substation standards.
- Optimize for a control center's lifecycle.

Control Center Communication

IEC® 61850-90-2 or -80-1 Edition 2
Time synchro IEEE® 1588v2

Remote I/Os

CB control IEC® 61850-8-1 Goose

Condition Monitoring

IEC® 61850-90-3

Asset performance management

ISO® 55000

Reliability

Hot swappable controller

Safety

SIL3 controller

Key takeaways

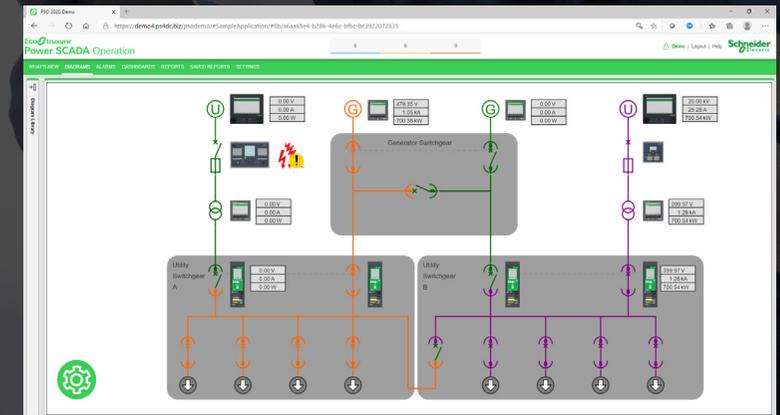
- Interoperability
- Future-ready architecture
- Empowerment for future evolutions



Arc fault protection

Improve safety.

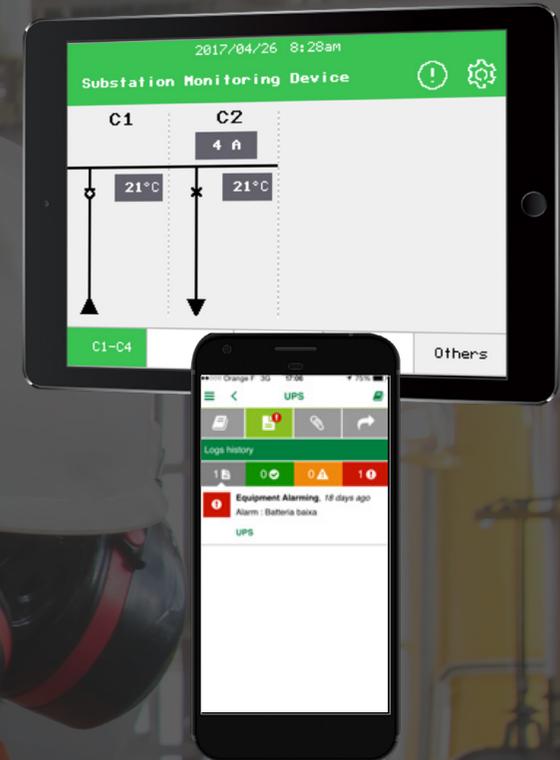
- Causes of internal arc faults — such as environmental conditions, equipment problems, forgotten tools, and animal intrusions — can be numerous and difficult to detect.
- Supplement proper safety policies by tripping fast at both MV and LV levels.
- Align with IEC® standards for LV and MV cubicles and relays.
- At low voltage, improve the safety of personnel via the digital adjustment of protection settings to trip faster when internal arc faults occur.
- Native feature in LV and MV connected products.
- EMCS with real-time visibility for fast response upon Arc Flash events, and post Arc Flash event analysis.



Nearby operations

Improve safety while ensuring energy availability.

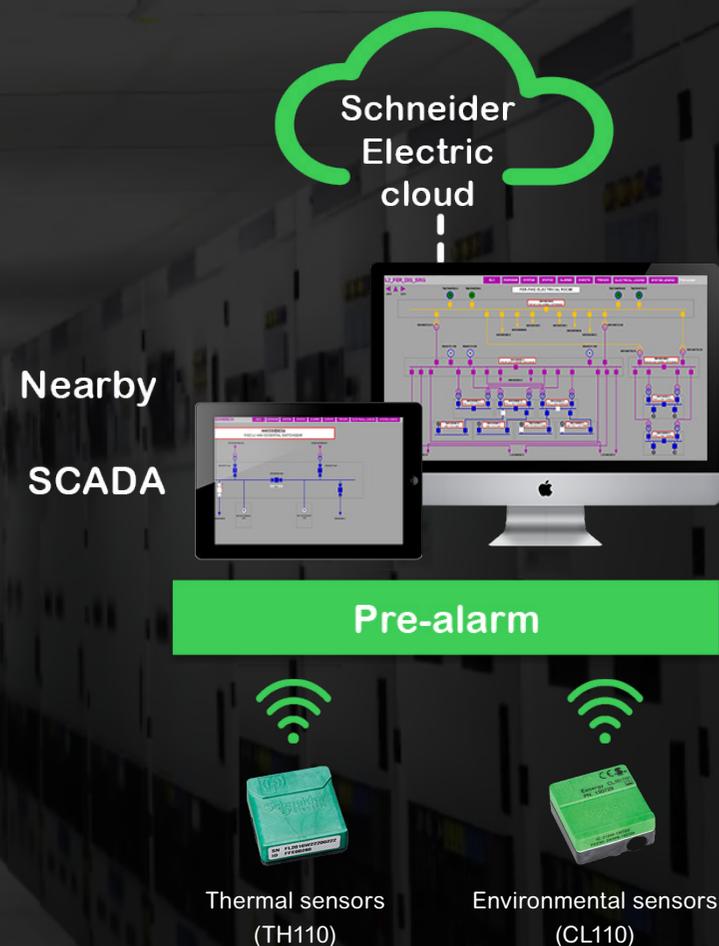
- Deliver the right information to the right person at the right time — and right location — via mobility solutions.
- Enhance the situational awareness of the operator in the substation with contextual access to information.
- Raise alarms at the EMCS level, via on-premise and off-premise notifications, to the right operator.
- In a degraded or isolated mode, allow an operator to access information, make diagnoses, and operate while standing away from equipment.
- Make user mobile experience seamless across the entire system, from substation to bay level to product level.



Continuous thermal monitoring

Help avoid electrical fires on the complete power system

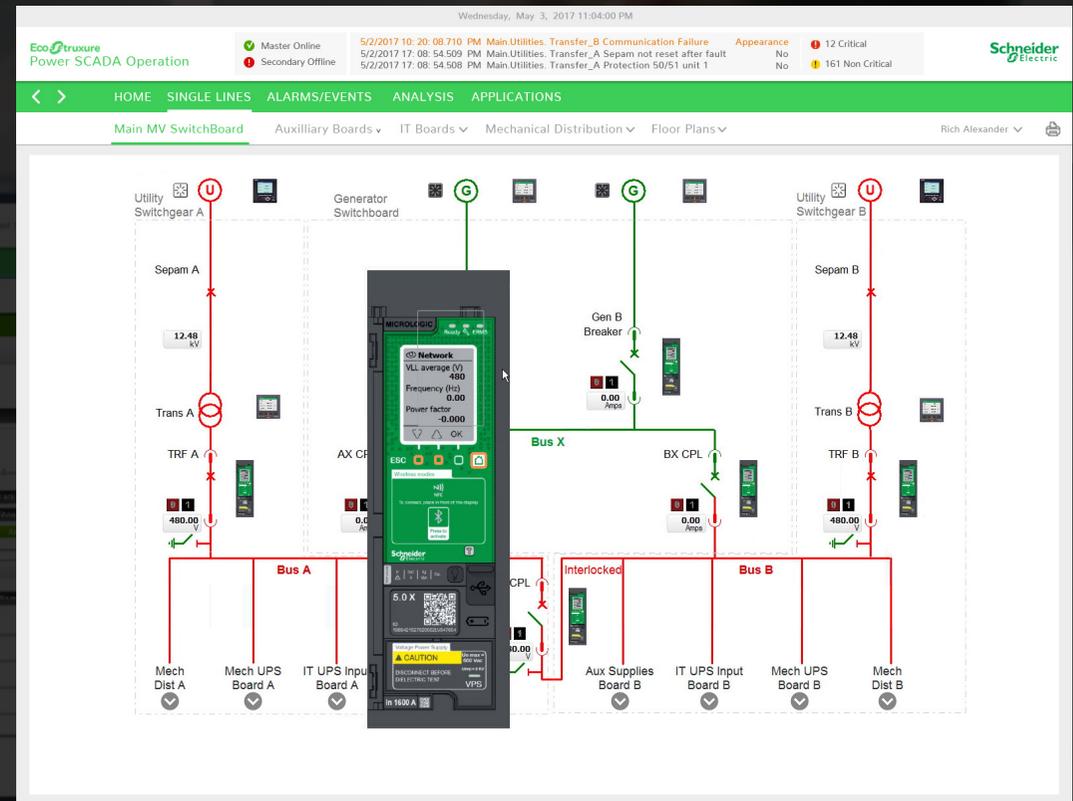
- Monitor temperature continuously via a central data concentrator with wireless sensors installed on the critical points.
- Avoid the cost of periodic, manual IR scan audits by third parties.
- Receive early detection of conditions that could cause fires with pre-alarm capabilities in edge control.
- Integrated digital architecture across the entire power system:
 - LV, MV, UPS, Transformers
 - EMCS
- With optional expert advisor services, optimize maintenance via more streamlined planning and scheduling.



Fast load shedding

Help ensure power reliability.

- Achieve best-in-class load shedding speeds (< 50 ms).
- Avoid power shutdowns due to generator and transformer issues.
- Save as much as \$4.5 million over three years for a typical FPSO 50,000 B/day.



EMCS with online condition monitoring

Prevent critical asset downtime.

- Perform local online condition monitoring on critical assets, including transformers.
- Acquire and refine data from various sensor interfaces.
- Integrated in EMCS alarming (smart alarm clustering) and advanced reporting and dashboards
- Interface with EcoStruxure Asset Advisor for predictive maintenance.

EcoStruxure Asset Advisor
(Service bureau)



EcoStruxure Power Scada Operations



Treatment Unit



Discrete I/O

mA (4/20; -20/20; 0/10; ...)

Serial com (Modbus, DNP, ...)

Ethernet com (IEC 61850,
Modbus, DNP, ...)



Thermal
Monitoring



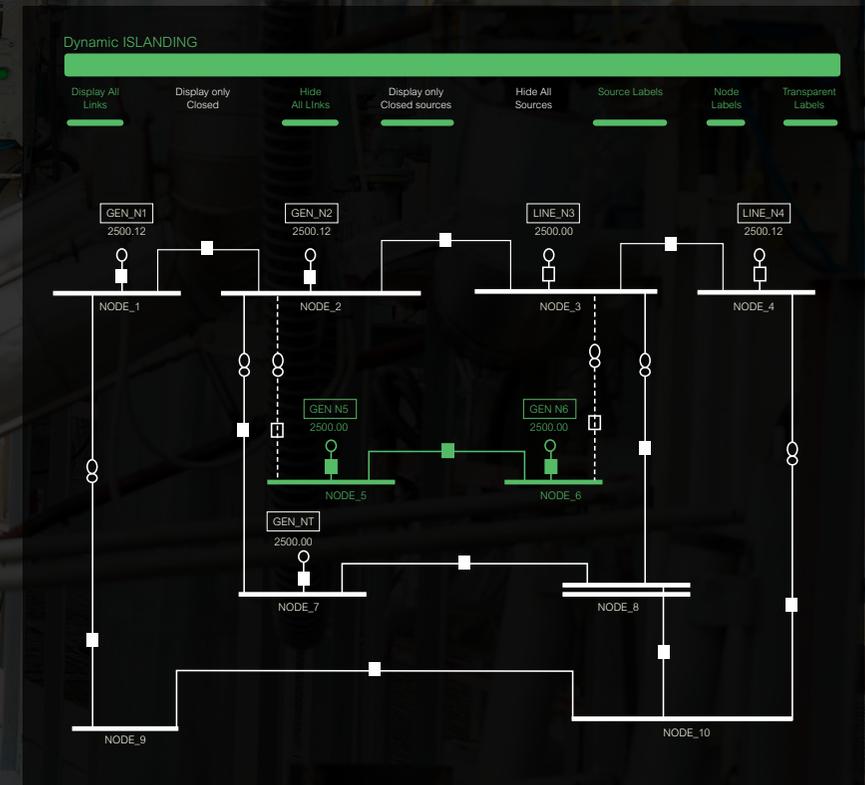
Environmental
Monitoring



Black start

Recover from outages and help restore power safely.

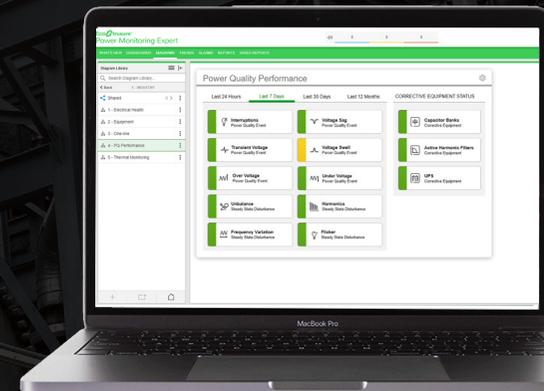
- Recover power quickly after a power generation shutdown.
- Follow simple, step-by-step energization and synchronization processes.
- Allow remote operation.
- Update easily with no generator configuration change.



Power Quality Monitoring and Correction

Increase Electrical System and Asset Reliability

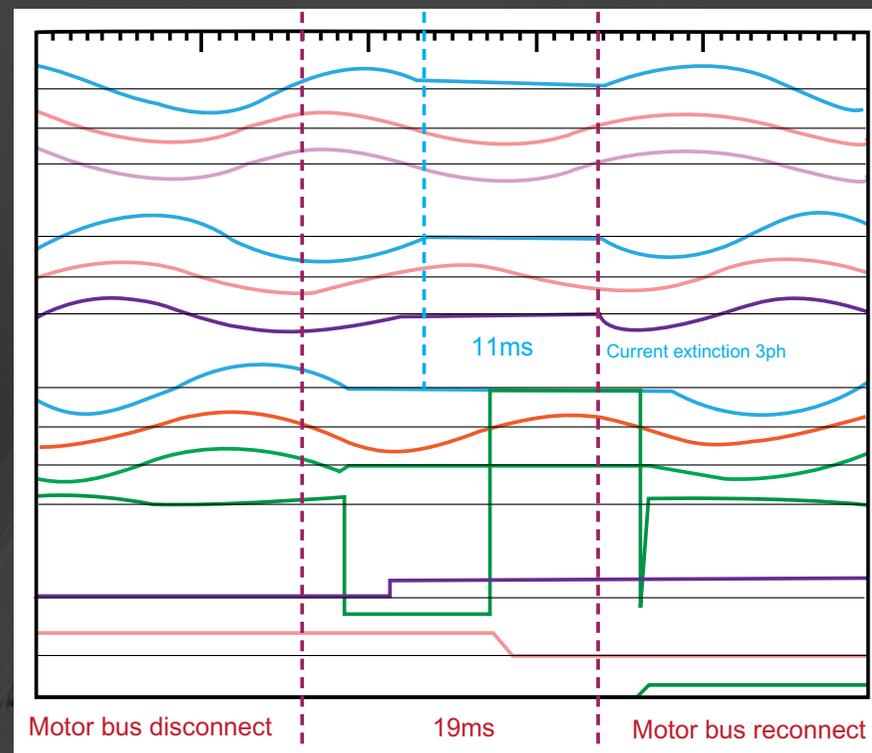
- Monitor persistent electrical disturbances such as harmonics, unbalance, flicker and over/under voltage conditions.
- Capture and study event details such as waveforms.
- Locate the directionality of events through Patented Disturbance Direction Detection.
- Trend and report on power quality issues to understand potential problems that could affect operations.
- Correct abnormal voltage conditions such as over/under voltages, harmonics and other factors affecting critical equipment like transformers, drives and PLCs.
- Gain expert advice with analytics advisory services to improve performance across the system.



Easy Fast Transfer

Help operator for efficient operations.

- Achieve better uptime with a cost-effective solution.
- Keep connected loads alive via manual source transfer.
- Operate a motor bus fast transfer system with overlapping sources.

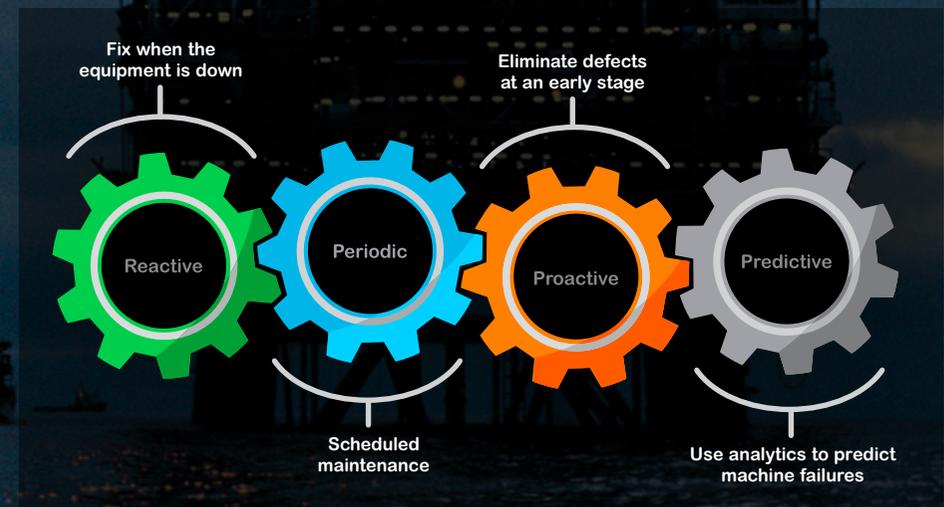


Asset performance

Save money by optimizing maintenance.

Move from reactive to predictive to condition-based maintenance strategies for critical assets like breakers, UPS, transformers, etc.

- Gain visibility of critical asset health and maintain as necessary.
- Access data from connected assets and edge control software to manage performance across an entire system.
- Enhance your maintenance strategy with expertise via digital services to determine the optimal time to maintain critical assets.
- Take advantage of a native EMCS connectivity to Cloud-based APM services that include predictive analytics and Schneider Electric expertise.



Microgrid solutions:

Pave the path towards carbon neutral operations

Microgrid solutions:

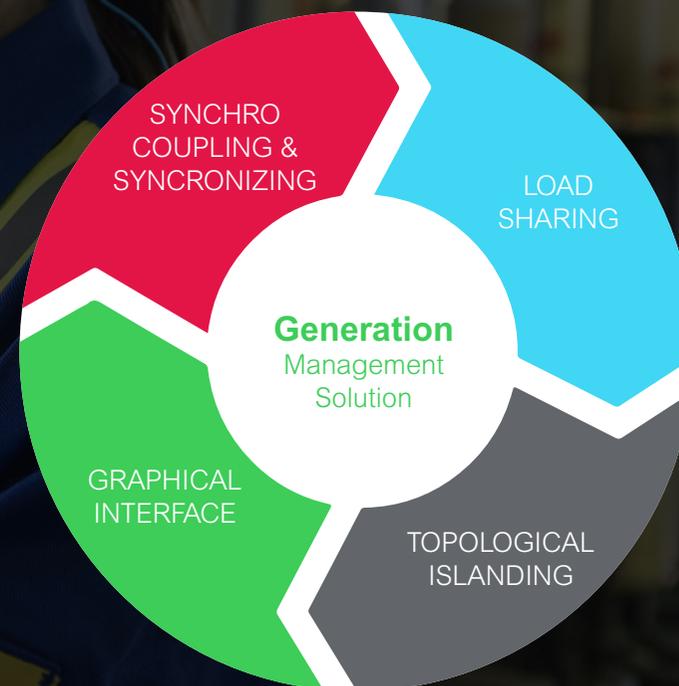
- Are designed and operated as an integrated energy system composed of distributed energy resources (DER) and interconnected loads.
- Are orchestrating DER and loads by an energy management system that controls Microgrid as a single entity.
- Enable hybrid power generation by optimizing various power sources including renewable energy (solar, wind, energy storage, hydrogen, field gas, grid power).
- Are versatile, enabling a variety of use cases such as off-grid operations in isolated areas, demand charge reduction, demand response, and frequency regulation.
- Reduce greenhouse gas emissions, and provide resiliency during outages while reducing energy cost.



Generator management system

Reduce energy costs.

- Control generators and maintain turbines at optimum power ranges.
- Gain situational awareness on machine efficiency with PQ diagrams.
- Reduce energy consumption and NOx emissions.



The digital solution for smarter investments and operations.

Choose EcoStruxure Power for your critical applications.

Your power system is at the heart of your operations, and critical to your process availability. Power supply also impacts a significant share of your capital and operational expenditure. Partner with Schneider Electric and help achieve the performance that only EcoStruxure Power can deliver.

EcoStruxure™ for Oil, Gas & Petrochemicals



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