Life Is On | **Schneider**
Electric

Partnering for project excellence

Schneider Electric automation and services for
Engineering and Construction companies

schneider-electric.com/processautomation

Schneider Electric as your partner

We invent technologies that will transform the places where we live, work, and play. With our ingenious design philosophy we deliver solutions that integrate seamlessly into the environment, supporting the rhythm of our lives and empowering people to do more with less.

Reduced costs. The Foxboro Evo™ Process Automation System delivers a wide range of functions, reducing the number of vendors to be integrated. The configuration environment has evolved to reduce the cost of translating process data to control and safety, thus reducing your complexity. And work done at front end engineering design (FEED) stage can be reused during design and testing phases.

Flexible Schedule. The Foxboro Evo underlying technology provides the foundation for template creation and structured deployment. Our Flexible, Lean Execution program (Figure 1) allows for further flexibility in schedule because most

configuration steps are automated and cross-checked. Unplanned changes are identified at the earliest stage and resolved applying pre-defined, consistent mitigation procedures. Because of our standard tools, we do not have to re-engineer the same solution every time.

Reduced risk. Our proven simulation technology and Flexible, Lean Execution (FLEX) program based on templates and rules removes many causes for manual errors. This provides more time to mature process data and to test applications.

Accurate and timely validation. Using process design products like PRO/II, we can contribute from the initial FEED stages, optimizing plant performance by improving process design and operational analysis and performing engineering studies thereby validating initial process assumptions and preparing in advance the documentation and databases required for the subsequent phases of the project development.

Compliance. Process flexibility. Reduced risks.

Our mission

To support your business objectives by providing solutions, services and stringent project management to enable you to deliver the best value compliant solutions at the lowest installed cost to your customers.

Business your way with scalable solutions and flexible services

Reduced overall costs. Achieve up to 35% cabinet reduction through Foxboro Evo which offers doubled processor capacity in a smaller footprint, universal I/O, remote I/O, safety integrated as an option, virtualization, remote engineering and reduced mean time to test and commission.

Improved integration and scalability. Realize up to 30% cost saving network infrastructure with Foxboro Evo, which secures dispersed architectures, viewing them as one system and making it easier to integrate modular plants and third party packages.

Ability to manage technological risks. Improve performance and revamp existing processes through our advanced simulation and statistical analysis tools and see why we have delivered nearly 600 successful simulation projects.
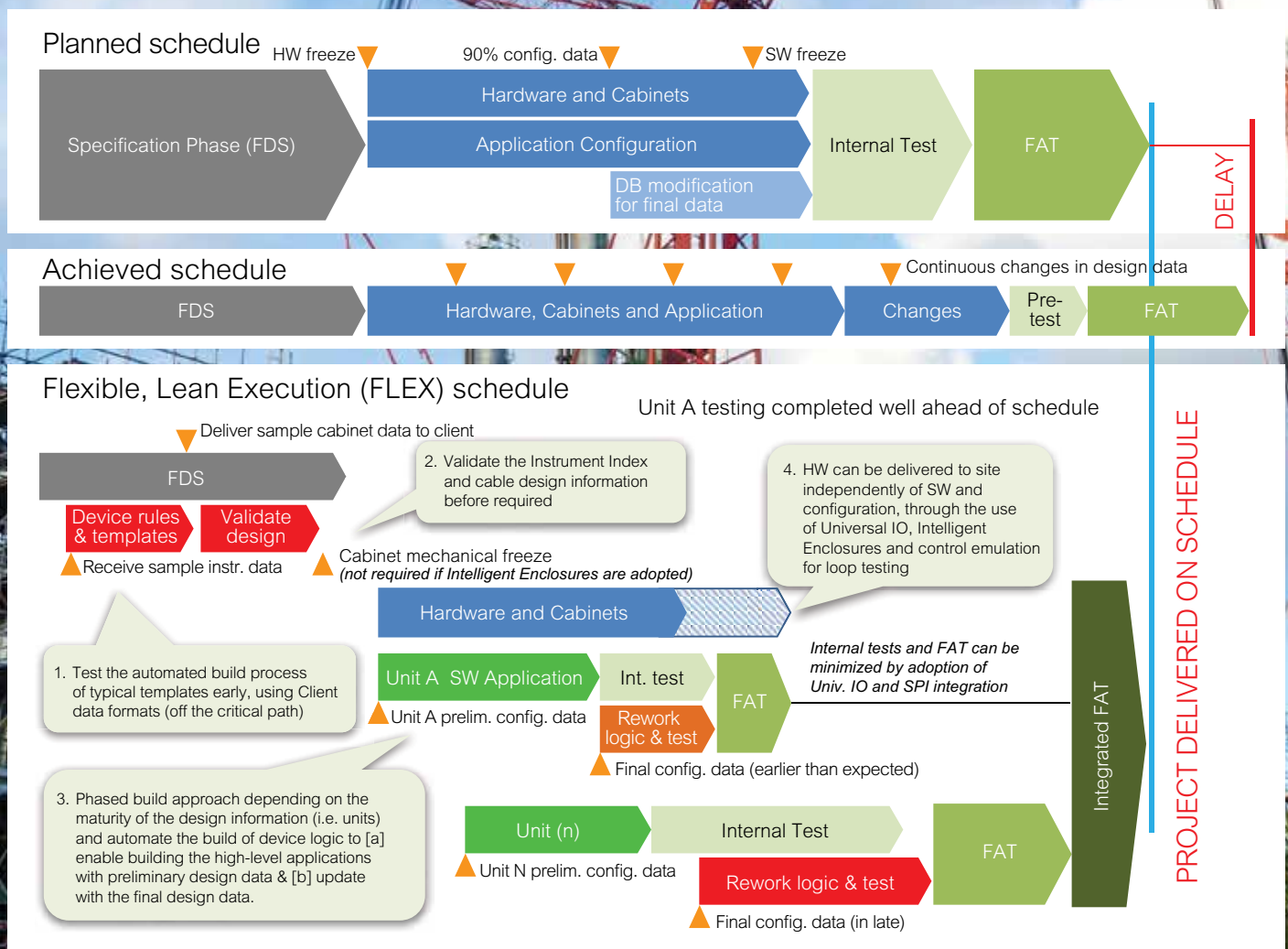
Confidence. Decrease execution risks — including human error — through Flexible, Lean Execution. Engineering Workbench, a FLEX component, extracts data directly from databases like Intergraph® SmartPlant® Instrumentation and uses them for our configuration, panel definition and test procedures.
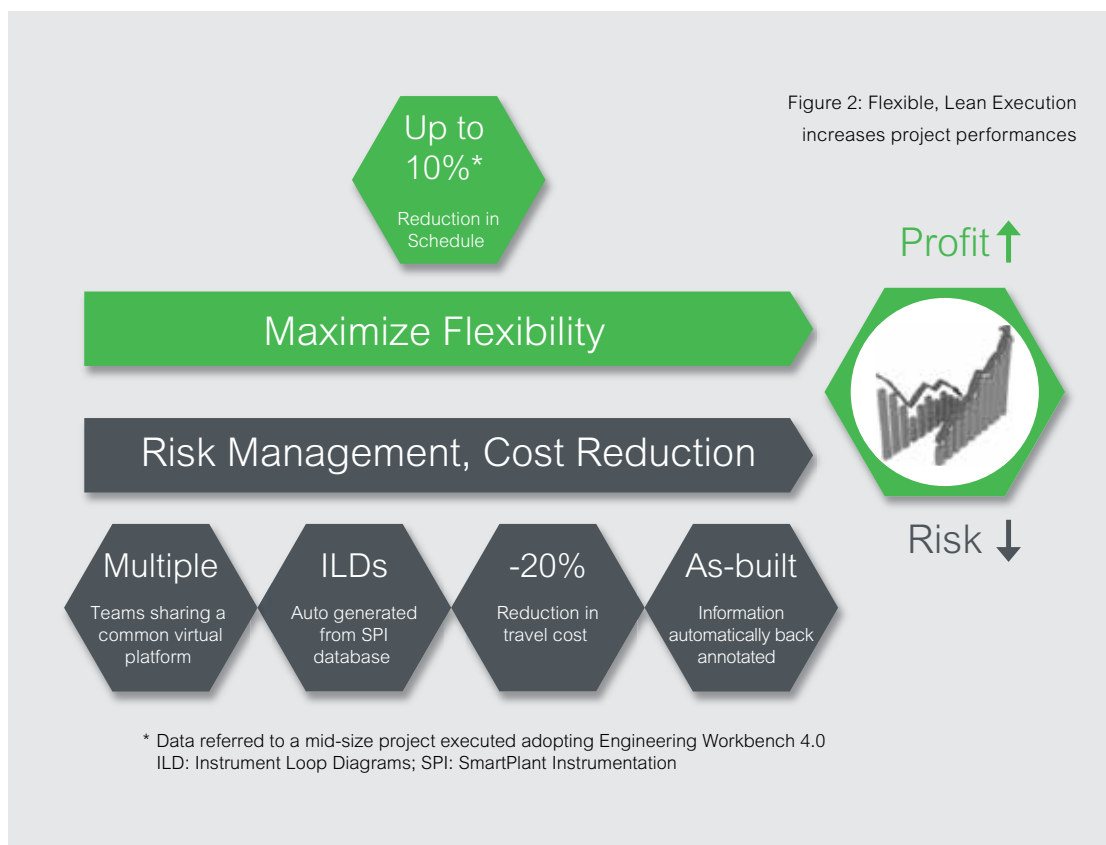
Regulatory compliance and cybersecurity. Protect yourself from today's cybersecurity threats with products which are secure by design and feature intrusion prevention best practices, or consider utilizing our consulting services to ensure regulatory compliance.

Comparing traditional and FLEX delivery schedules

Figure 1: Upper chart shows a typical project execution plan (PEP) without the use of FLEX. Lowe chart is the same project PEP that shows the positive impact FLEX has on project completion.

Planned schedule

HW freeze   90% config. data   SW freeze

Specification Phase (FDS)

Hardware and Cabinets

Application Configuration

DB modification for final data

Internal Test

FAT

DELAY

Achieved schedule

Continuous changes in design data

FDS

Hardware, Cabinets and Application

Changes

Pre-test

FAT

Flexible, Lean Execution (FLEX) schedule

Unit A testing completed well ahead of schedule

Deliver sample cabinet data to client

FDS

Device rules & templates   Validate design

2. Validate the Instrument Index and cable design information before required

4. HW can be delivered to site independently of SW and configuration, through the use of Universal IO, Intelligent Enclosures and control emulation for loop testing

Receive sample instr. data

Cabinet mechanical freeze
(not required if Intelligent Enclosures are adopted)

Hardware and Cabinets

1. Test the automated build process of typical templates early, using Client data formats (off the critical path)

Unit A SW Application   Int. test

Unit A prelim. config. data

Rework logic & test

FAT

Internal tests and FAT can be minimized by adoption of Univ. IO and SPI integration

Final config. data (earlier than expected)

3. Phased build approach depending on the maturity of the design information (i.e. units) and automate the build of device logic to [a] enable building the high-level applications with preliminary design data & [b] update with the final design data.

Unit (n)   Internal Test

Unit N prelim. config. data

Rework logic & test

FAT

Integrated FAT

Final config. data (in late)

PROJECT DELIVERED ON SCHEDULE

Figure 2: Flexible, Lean Execution increases project performances

Up to 10%*
Reduction in Schedule

Maximize Flexibility

Risk Management, Cost Reduction

Profit ↑

Risk ↓

Multiple
Teams sharing a common virtual platform

ILDs
Auto generated from SPI database

-20%
Reduction in travel cost

As-built
Information automatically back annotated

* Data referred to a mid-size project executed adopting Engineering Workbench 4.0
  ILD: Instrument Loop Diagrams; SPI: SmartPlant Instrumentation

EPC's project constraints

- Meeting schedule
- Staying within budget
- Securing both capital
- Investment and initial operational expenditure
- Satisfying operating criteria

EPC's project challenges

- Incomplete FEED phase
- Multiple vendors
- Changing operating requirements
- Difficulty managing 3rd party integrators
- Unfamiliarity with new products, technologies, suppliers
- Late changes on project specification and data
- Staff turnover
- Poor startup planning including resource support
- Stringent delivery process and contractual terms & conditions
- Consolidate risk and accountability
- Stringent consistency and control is required due to globalization

Safety and sustainability

31

Number of Schneider Electric process automation locations that acheived one million worked hours without a recordable injury by year end.

Schneider Electric implements operational controls throughout the corporation with policies, standards aguidelenes, including checks to prevent pollution, reduce injury and illnesses and respond to emergency situations. Our policies set worldwide standards.

Operations Management Solution: from front

Engineering lifecycle

A structured stage-gate approach from FEED
to operations removing uncertainty, reducing
complexity and increasing control throughout the
project lifecycle.

FEED
- Accurate physical properties to avoid "over" design
- Process model migration to operation
- Integration of FEED info to MIS/MES

Design
- Minimize rework with re-usable templates
- Ability to accept late design information
- Engineering interface using SPI

Construction
- Process models to validate design changes
- Integrated plant asset management, condition monitoring, equipment history tracking
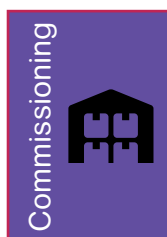
Commissioning
- Automatic backfill site modification
- Training services with 3D Virtual Reality
- Control checkout for ICSS system through OTS

Operations
- Provide the owner with mobile work procedure and mobility solution
- Full operational advanced control for plant optimization at startup
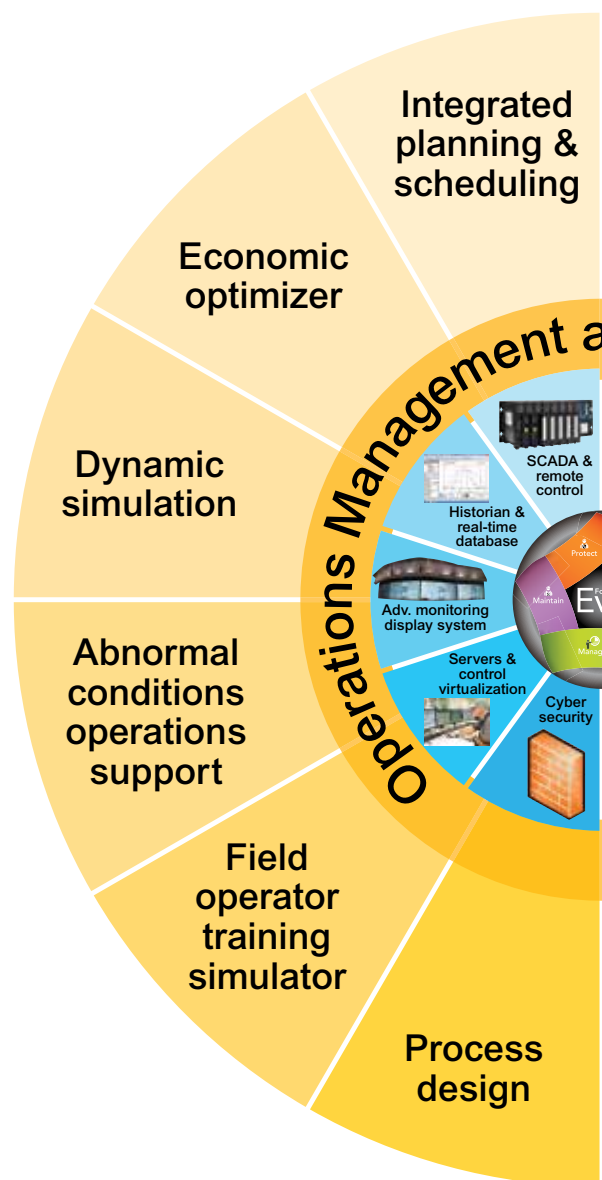
Operations Management Solution — While instrumentation is vital to provide reliable measures and actuation, operations require production flexibility, consistent product quality and safe and secure environmental conditions. The Foxboro Evo process automation system has a unique open technology to provide a platform that covers all engineering

# t end engineering design to plant operations

Foxboro Evo changes everyone

Our modern process automation system delivers value across all functional areas and provides a foundation for a complete production and operations management solution.

- Doubled capacity in smaller footprint
- Cloud-based engineering
- Reduced mean time to diagnose starting from commissioning

Engineer
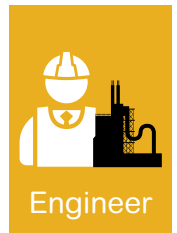
- Faster training with fewer operator errors
- Managed workflows and audit trails
- Enhanced situational awareness to prevent abnormal situations

Operate

- Contextualized data for best performance from handover
- Enterprise modeling and monitoring
- Enhanced security and safety

Manage

- Confidence during testing and commissioning
- Integrated field device management
- Contextualized alerts and guided workflow

Maintain

- Integrated safety to provide congruent data
- Full cyber security
- Industry leading safety system

Protect

and operational needs; enabling testing of operational behaviors at a very early stage and decreasing risks by maintaining flexibility. The final result is a rich set of plant data that is structured to make informed business decisions and keep costs under control.

Project execution: not an everyday business

Complexity under control. Global Delivery Operations Program is designed to develop new engineering capabilities to address ever-changing technological needs. The execution of a project follows a five stage gate process resulting in a stringent control over activities, resources, and time to task completion. Risks associated with unpredictable events are identified and resolved at the earliest possible stage.

Flexible, Lean Execution. FLEX leverages Schneider Electric's technologies to mitigate the human influence on project execution and ensure that automation is off the critical path.

Consolidated risk and accountability. Whether you are looking for a product, a solution or a service methodology, Schneider Electric will be your single point of accountability.

Global presence with local content. Our direct presence spans across six continents and is continuously growing to serve our customers' requests. We strive to maximize local contribution by leveraging our educational services and qualified resources at each level.

Vertical industries expertise. Foxboro Evo has been designed with industry needs in mind, leveraging more than 100 years of experience in successful projects delivery. This results in system performance beyond expectations.

One-stop shop solution. Schneider Electric's unique operations management and optimization solutions offer a range of products to deliver a completely integrated and open business system.

A disciplined project approach to minimize execution risks

FLEX Schedule. Kick start the project with minimal amount of design inputs, removing automation from project critical path. Reduces project schedule by approximately 20 percent.

FLEX Location. Our Virtualized Engineering Environment (SEVEE) allows engagement of multiple parties, reducing the need to travel. Reduces 60 percent of T&L costs.

FLEX Data. Engineering Workbench enables to change process data parameters at late phases of the project. SmartPlant Integration provides reports to build errors free instrument loop diagrams (ILDs)

FLEX IO. Control and safety universal I/O modules with their configurable features, alleviate the client from defining all types of I/Os at the beginning of the project.

FLEX Testing. The combination of all FLEX technologies allows the software to be tested independently from the hardware and remotely. Ensuring faster path to deliver to site.

Your partner. Every step of the way.

Faster time to profit. Foxboro Evo and the Schneider Electric global engineering management team minimize the time to production, and ensures product quality and planned cost.

Social responsibility. We are committed to: sustainability, internal and external training, operating efficiency and safety, health and safety performances, employee diversity, inclusion in the workforce, and civic enrichment.

Just what you need. We listen with an open mind, rather than proceeding with a predetermined recommendation.

Client satisfaction. Our maintenance and support services program, Customer FIRST, provides clients with the best possible experience with our products, solutions and services.

Training. Our Learning Services program has a curriculum of more than 300 courses and learning solutions to maximize the effectiveness of any technical profile. We provide advanced training tools including simulators designed for field engineers, operators, maintenance and configuration engineers.
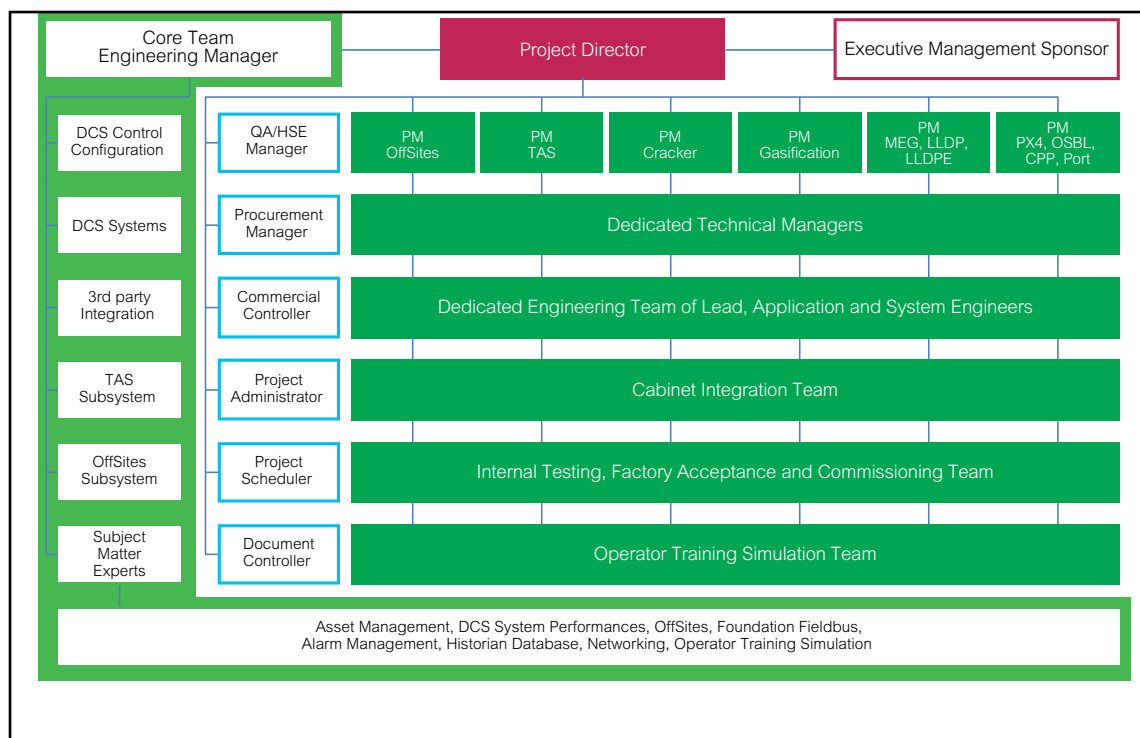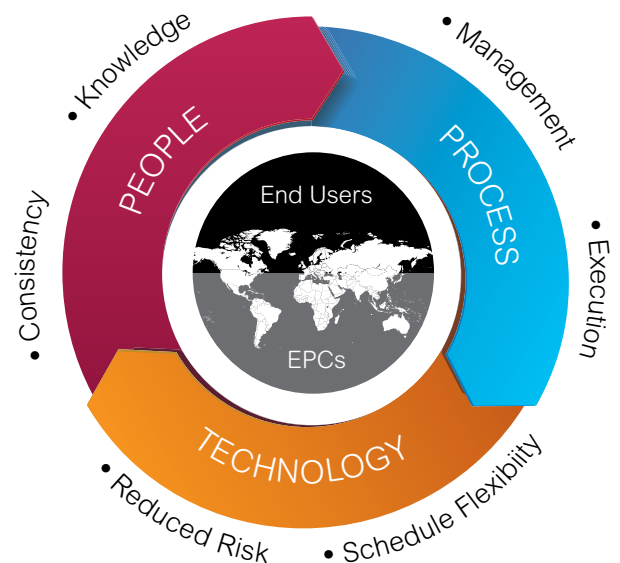

Figure 5: An example of resource allocation for a refinery project.

A success story

Recently, our Australian team had to manage a large project for a greenfield specialty chemicals facility. Included in the project were a Foxboro control system and Triconex safety system that interfaced to approximately 15 packaged units using a number of communications protocols. Furthermore, the project was to be completed within an accelerated timeline of 12 months — design to commissioning. Given the project's complexity and completion deadline, error-free configuration and testing were imperative. The Engineering Workbench, a FLEX component, was integrated into the project to speed up configuration and testing. As expected in compressed projects, there were significant design changes throughout the project and the ability of Workbench to track these changes and regenerate code enabled the project to stay on schedule. The greatest benefit was derived from the accuracy of the logic and documentation being auto-generated to keep track with last minute changes. As a result of the Workbench's reliability, the client only tested 10% of the input data rather than the entire data set, which in turn reduced the testing effort required, documentation approval and sign off, all of which are time consuming.

Life Is On | Schneider Electric