



# ABB integrated solutions and life cycle management Electrification and automation - Prepared for Shell



We understand that in order for Shell to remain competitive in this challenging market, you need both safer, better and faster capital projects and operational excellence from your current and future assets.

# How ABB can help Shell stay competitive in a changing oil and gas environment

The days of easy oil are over. With new oil reserves in deeper, colder or harsher environments, oil and gas projects have become increasingly complex. Costs are going up, but production is declining. And competition in the oil and gas marketplace is steadily increasing as more companies enter the global playing field.

We understand that in order for Shell to remain competitive in this challenging market, you need both safer, better and faster capital projects and operational excellence from your current and future assets.

ABB has the right capabilities, the right people and the right global reach to support Shell on effectively deploying CAPEX while helping to reduce OPEX. We have more than 7,500 dedicated oil and gas employees around the world, plus more than 1,800 service professionals in 28 countries. We have more than 50 years of oil and gas experience and have completed hundreds of projects globally.

ABB stands ready to work with Shell to meet its business goals.

## Capital projects

### **Efficient execution through an integrated systems approach**

One of Shell's goals for its capital projects is efficient execution, targeting overall project cost reductions. ABB's integrated systems approach offers several drivers for efficiency in several project phases as follows:

#### **Your goal: Reduce complexity in plant design/construction** **What integrated systems offer: Risk reduction and equipment optimization**

By purchasing an integrated power and automation system, ABB becomes accountable for the electrical and automation supply integrated into EPC team. We would provide an integrated solution fit for purpose, deploying latest technologies agreed upon with Shell and EPC team to support the cost competitiveness of the overall project. Since the scope, responsibility and overall ABB participation on the project would increase, the risks are also shared. For this model, there are several commercial structures would like to discuss including a potential risk/reward contract structure. This model is about to be used at Lake Charles LNG, where our experienced, cross-functional team is ready to execute.

The proper sizing and optimization of systems topology provides the most-efficient equipment mix for your operating requirements. An optimized equipment selection with standard communications leads to reduced footprint needs. For example, we were able to achieve over 20% space savings in our e-House offering at Orascom by eliminating marshaling cabinets and cable planning, plus optimized equipment selection and bus runs. This solution also provided direct integration into System 800xA through a ready-made IEC 61850 library with pre-made object types.

#### **Your goal: Reduce engineering hours and manage costs** **What integrated systems offer: Simplified project management, contracts and procurement**

By using an integrated system approach, your projects will require fewer site resources, and we would take accountability for system interfaces. The overall EPC hours are considerably reduced, since the electrical and automation systems will be efficiently managed by system integrator. The ABB product and systems incomparable breadth reduces systems and products integration complexities. To illustrate this point, with an integrated control room, you can achieve an efficient 24-month startup period for project startup and commissioning. As an example, Lake Charles LNG has the potential to save over 50,000 man hours via an IED approach.

This approach also offers schedule efficiency. ABB takes on the systems accountability, which simplifies the critical path for deliveries. This also enhances change management throughout the project, as engineering and drawing cycle times are reduced. The reduced engineering, change orders and procurement lead times can deliver significant savings, such as the 20% schedule improvement we achieved at Grane for Statoil.

System purchasing of integrated power and automation also yields cost savings throughout the scope of the project. ABB's integrated approach can achieve 10%-15% savings at a lump-sum, turnkey project as compared to a traditional approach. ExxonMobil validated a 20% cost savings at Point Thomson across the wide scope of the project.

# Relative Savings:

## Integrated System Delivery Partner

ABB 12 - 20%<sup>(1)</sup>

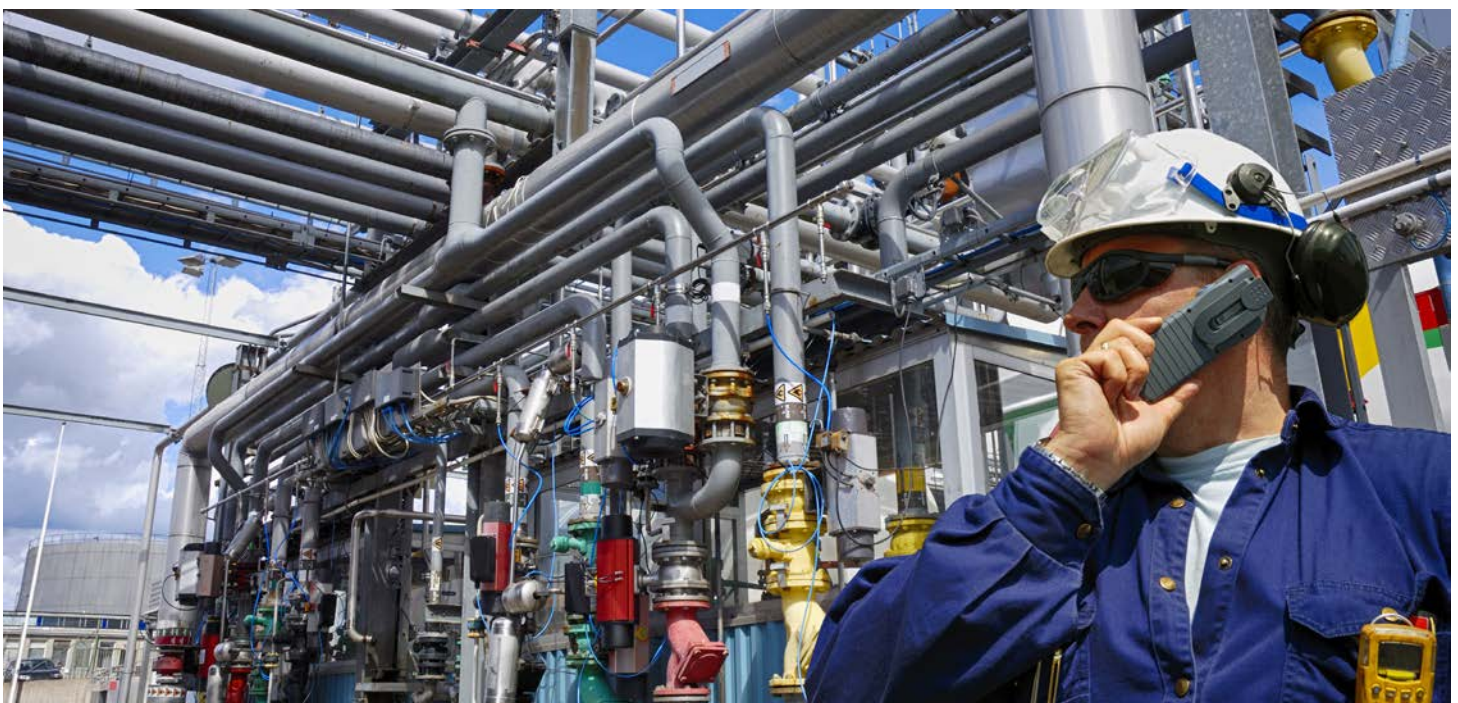
EPC 20 - 40%<sup>(2)</sup>



<sup>(1)</sup> ABB is system integrator and takes responsibility for system delivery, performance and optimized solution

<sup>(2)</sup> Additional reductions come from lower engineering, risk factor reductions, procurement/expediting/etc, civil reductions, technology integrations

The examples above are only considered from the view point of integrating electrical and automation products and systems, without accounting for the considerable EPC hours managing such projects. We estimate it is possible to yield savings up to 40% on the EPC man/hours side.



# Operational excellence

## Addressing brownfield challenges

In order to get the most from your capital investments, you have to achieve a positive revenue balance. Your facilities must operate safely, reliably and efficiently in order to get that balance right, and ABB can help.

### Your goal: Increase plant productivity

#### What ABB offers: Oil and Gas Care service portfolio

Efficiency, cost control and focus on core activities are some of the critical success factors in today's challenging business environment. An ABB Oil and Gas Care service agreement offers you consistent service delivery across electrical and automation. ABB's global service network, less administration, and a modular, needs-based approach based on your requirements, will deliver optimized life-cycle management for Shell's current assets.

Our service portfolio directly contributes to increased productivity through maximized equipment availability, increased throughput and competitiveness, optimized and extended equipment life, and sustainable results. From repairs and spare parts to consulting and advanced services, we can support the complete life cycle of your assets.

### Your goal: Collaborate in a data-driven ecosystem

#### What ABB offers: ABB's IoTSP approach

In an increasingly data-driven world, you need a solid strategy for managing that data and converting it to useful information in order to stay competitive. Shell will need partners who also stand ready to reap the benefits of data availability, analytics and technology advances.

ABB is advancing digital industry through our concept of the Internet of Things, Services and People (IoTSP). We connect the Internet of Things (IoT) with advanced services to enhance collaboration of machines, people, and ultimately of plants and companies, driving competitive advantage for our customers. We can utilize the IoTSP by helping Shell to benefit from their existing technologies, while keeping sight of our enduring commitment to safety, reliability, cyber security and data privacy.

The IoTSP ecosystem allows enhanced collaboration between field service personnel, service providers, ABB consultants and Shell. In this approach, equipment and asset models are stored in the cloud, via a secure connection platform. Because we capture and store historical data, we can detect trends and start to predict when maintenance is required. This supports a transition from reactive maintenance to a more efficient, predictive maintenance model.

# ABB installed overview



## Rapid Response

We maintain a constant connection to make every day a reliable one. We are at your service around the clock with unlimited technical phone support to maximize your equipment availability.



## Operational Efficiency

We optimize the usability and efficiency of your systems and equipment, with a flexible way to upgrade and enhance installed products, to increase your productivity.



## Lifecycle Management

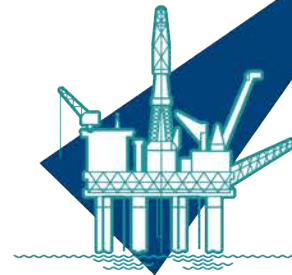
We deliver critical expertise, powerful tools, and a dedicated support leader you can contact directly to optimize and extend your equipment lifecycle and protect your investment.

## Shell sites

There are

# 295

Shell sites that include ABB equipment.



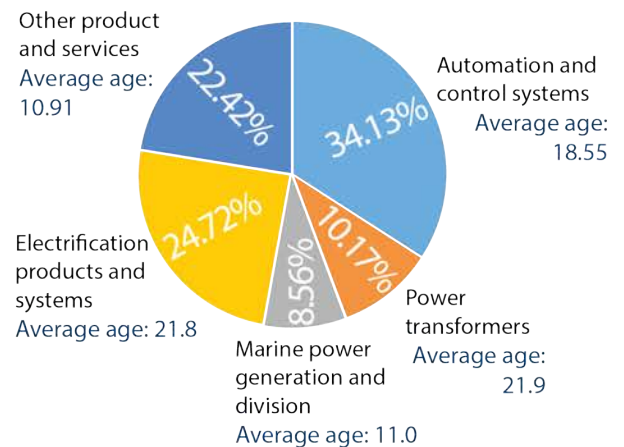
The installed base value of these ABB sites is

# \$1.3+ billion

Do not include all ABB acquired companies installed base such as Esakkor, Thomas & Betts and others.

## Installed base

### Shell installed base distribution and average age of IB



# Commitment to safety, quality and integrity

## Safety

The safety and good health of our employees and contractors are a top priority for ABB. We have a duty of care and know that our ability to carry out business successfully depends on robust health and safety performance. We know Shell shares the same goals and vision, making our partnership stronger through shared values.

We believe it is the responsibility of management and employees to create a safe work environment, such that our operations do not place our staff, our business partners, or the local community at risk. As we recognize health and safety is an integral part of all our activities, we will provide adequate resources to demonstrate our health and safety principle of “Deliver safely, on budget, on time, in full, and to the right quality.”

We aim to ensure safe work environments and create a culture of health and safety within the company that supports an optimal business performance.

## Quality

There are many dimensions in which ABB can compete, but none of these are meaningful for Shell without a foundation of quality. The responsibility for quality is something that must be owned by every person, every business, and every location that ABB calls home.

To ensure that we meet our responsibilities and obligations to Shell, our people, our partners, our suppliers and to our shareholders, we are committed to seven quality objectives focused on continual improvement.

Through our quality assurance programs and international standards, ABB aims at providing the best products, systems and services on the market.

## Integrity

ABB sets high standards of integrity and compliance. We use a systematic approach, designed to foster a culture of integrity and compliance. This is done through leadership and business accountability, supported by strong tools and processes, and with a zero tolerance policy for violations.

We are committed to integrity, and we walk away from non-compliant business. Our Code of Conduct clearly explains the behavior ABB expects of every employee and partner around the world. Based on our business principles of responsibility, respect and determination, it is the foundation of everything we do in connection to our work at ABB.

Our employees and partners apply these business principles to their work and actions on a daily basis. Our principles are about providing our customers affordable products and services without compromising on quality or reliability. But they are also about doing the right thing more generally – following the law, acting honorably and treating each other with respect.

# Commitment to innovation

For more than 125 years, we have developed technology to help drive the modern world. From the earliest roots of our company to the present day, innovation is ingrained into the DNA of ABB.

We realize that innovation is critical to our mission of providing power and productivity for a better world. Each year we dedicate around \$1.5 billion to fund research and development activities driven by our 8,500 technologists in our four divisions and seven corporate research centers.

This investment provides significant returns in technology leadership. In 2014, ABB registered more patent applications with the European Patent Office (EPO) than any other Swiss-based company. (Switzerland remains top of the world rankings for the number of patents filed per million inhabitants.)

In recent years, we've developed a number of innovations that directly support our IoTSP concept:

- Smart motor sensor with iPhone app
- YuMi collaborative robot
- DriveTune, DriveBase and Field Information Manager for smart ABB instrumentation
- Switchgear that deploys a new insulation gas mixture as a substitute for sulfur hexafluoride (SF<sub>6</sub>)
- Most powerful subsea and underground extruded HVDC power transmission and cable system (525 kV)

These technologies enable our customers to improve data analysis, boost productivity, enhance reliability, save energy and costs, and generate new revenue opportunities through innovative business models.



## Commitment to Shell

ABB has extensive experience with both Shell and BG Group, with Shell sites including ABB equipment on every inhabited continent.

ABB is committed to elevating our partnership to the next level, helping Shell to reach its goals by utilizing an integrated electrical and automation systems model supported by life cycle management services.

We have supplied consulting support to Shell for over 10 years, including full life cycle alarm management services, sustainable process safety and process safety in design, along with several electrical products and systems. Those products, systems and services combined have provided significant benefits for your production goals over the years. As one example, by helping Rashid Petroleum Company (Rashpetco) apply good alarm management practice, the company was able to achieve a more than \$2 million USD per year gain in extra production.

We also have service agreements with Shell in key locations. In the North Sea, for example, our services have helped you achieve improved alarm rates across all UKCS assets, with all assets “in the green” as of April 2016. This world-class performance allowed this to be the first Shell asset globally to achieve demanding corporate targets: an average alarm rate of less than 1 in 10 mins and time outside target of less than 1%.

Finally, Shell has selected ABB for global enterprise frame agreements in motors, drives, low voltage switchgear, low voltage motor control centers, telecoms and total solutions for lubricant plants.

This level of partnership fosters collaboration and deploys innovative solutions while increasing efficiency, accountability and understanding of each other’s goals and objectives.

## 30 Days Challenge - ABB Core Team:



**Greg Scheu**  
CEO ABB Americas



**Brandon Spencer**  
North America Hub VP  
of Oil, Gas & Chemicals



**Rob Doove**  
Global Shell Account Manager



**Cleber Angelo**  
Americas Shell Strategic Account Manager



**James Crowl**  
North America Service Manager



**Malin Svan**  
Global Marketing Service Manager  
Oil, Gas and Chemicals



**Troy Stewart**  
Europe Hub Service Manager -  
Oil, Gas & Chemicals