

# Operational Excellence for Unconventional O&G

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# 2017 Emerson At-A-Glance

FOUNDED

**1890**

HEADQUARTERS IN  
**ST. LOUIS, MO**  
USA

## RECOGNITION

**#139**

2017  
**FORTUNE 500**  
AMERICA'S LARGEST  
CORPORATIONS BY REVENUE

**Top 50 Employers**  
WOMEN ENGINEERS MAGAZINE

**America's Best Employers**  
FORBES MAGAZINE

## TWO BUSINESS PLATFORMS



EMERSON AUTOMATION SOLUTIONS



EMERSON COMMERCIAL & RESIDENTIAL SOLUTIONS

## WORLDWIDE

**76,500**  
EMPLOYEES

**200**  
MANUFACTURING  
LOCATIONS

## INNOVATION

EMERSON EMPLOYEES WERE AWARDED MORE THAN

**2,100** PATENTS WORLDWIDE IN 2017

**\$15.3**  
**BILLION**

IN GLOBAL SALES  
FISCAL YEAR 2017

**61**  
YEARS

CONSECUTIVE YEARS OF  
INCREASED DIVIDENDS

**NYSE:**  
**EMR**





## Emerson Automation Solutions *Enabling Top Quartile Results*

### Operational Certainty

Our technology- and engineering-based program is designed to help industrial companies achieve Top Quartile performance and recover more than \$1 trillion\* in **operational** losses globally.

### Project Certainty

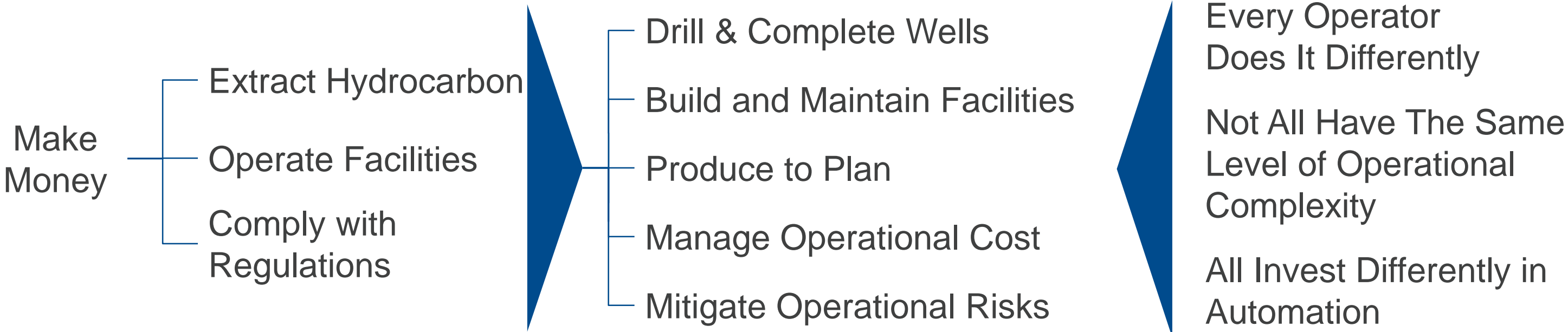
We combine innovative technology and engineering to improve **capital efficiency** and boost **project schedule** reliability—helping to address the billions of dollars lost due to project excesses each year.

### Plantweb Digital Ecosystem

**Our Plantweb digital ecosystem provides a robust portfolio** of hardware, software, intelligent devices and services for securely implementing the Industrial Internet of Things, with measurable business performance improvement.

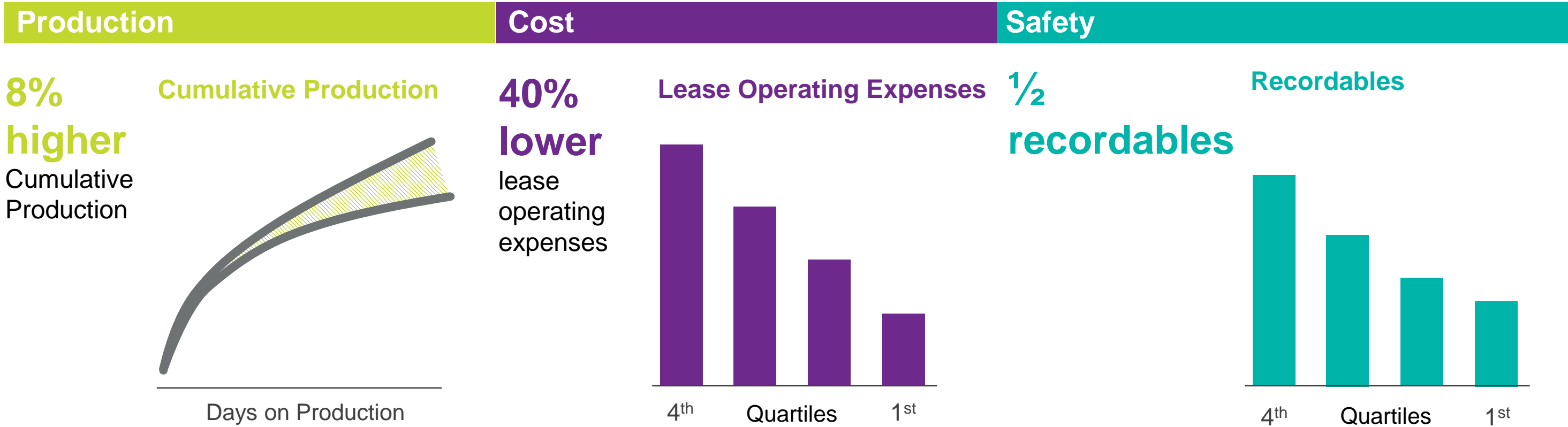
\*Emerson internal estimate

# Unconventional O&G Operators Face Challenges



Resource Constrains + Data to Information Transformation + Untimely or Wrong Decisions

# Industry Benchmarks Reveal Significant Operational Business Improvement Opportunities from Average to Top Quartile Performers



Sources: Lower 48 US liquids-weighted LOE Benchmarks, EnerCom, OSHA, Company Reports and Emerson Customer Business Results

**The Opportunity for Operators in the Lower 48 is \$7B+ Annually**



# Best-In-Class Operational Practices for Unconventional Producers

## Link Strategy to Business Objectives



**COLLABORATION**  
high quality collaborative efforts between people and work groups



**WELL REVIEW PROCESS**  
are more efficient through near real-time analysis of financial & operating data

Operational leadership is committed to



**MANAGE BY EXCEPTION**

## Demand a Culture of Accountability



Produced fluids are tracked to custody transfer producing real-time transaction data for **ROYALTY & VENDOR** information integrity



Performance is based on **PEER LEADERSHIP** not adherence to plan



Continuous improvement mindset with **ARTIFICIAL LIFT SYSTEMS**

## Embed Expertise in Work Processes & Applications



**STAFF PROFICIENCY** is accelerated through intuitive procedures enabled by technology



**AUTOMATES OR ELIMINATES** personnel tasks in hazardous areas



**REAL-TIME PRODUCTION MODELS** are used to optimize performance instead of comparable type-curves

## Optimize with Real-Time Data



Work processes are **INTEGRATED** and data-driven



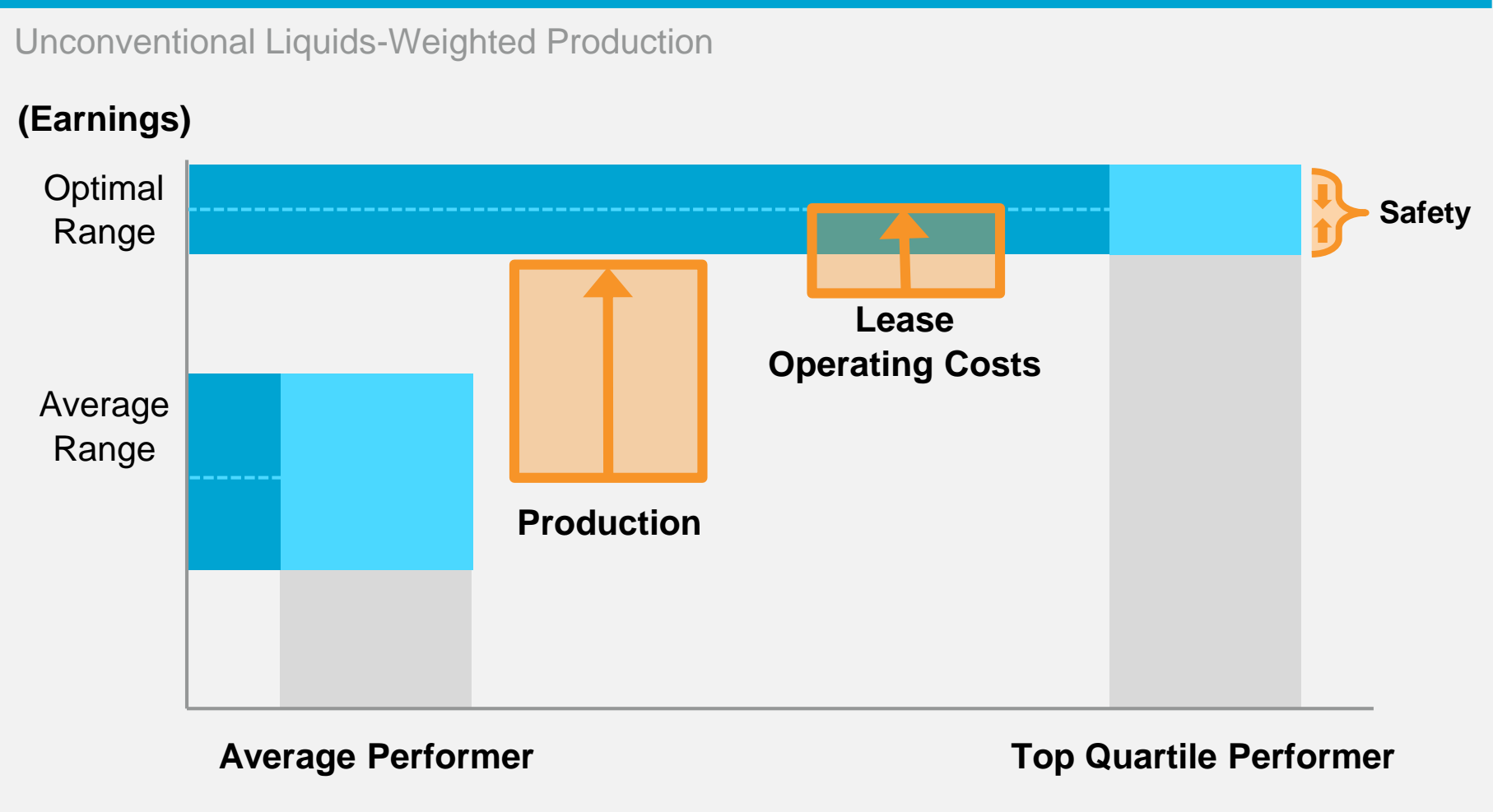
Work identification is driven by **WELL & EQUIPMENT PERFORMANCE**



**SAFETY INSTRUMENTATION** including relieving devices are monitored in near real time to ensure proper functionality

# Emerson's Operational Certainty Drives Top Quartile Performance & Enables Industry-Leading Business Results

## 6% EBITDAX Improvement Opportunity by Partnering on a Comprehensive Improvement Program



### EBITDA Opportunity Breakdown

Production	
Automated Production Surveillance	7-8%
Production Modelling & Analytics	
Produced Fluids Management	
Lease Operating Costs	
Automated Well Cost Allocation	2-3%
Equipment Reliability	
Vendor Compliance & Measurement	
Health, Safety, Security & Environmental	
Reduce Personnel Exposure	Mitigate Variability
Asset Integrity Monitoring	
Mitigate Environmental Impact	

Source: Benchmarking Data & Internal Estimates; Note: EBITDAX has been used as a proxy for Business Performance (Earnings)

**Top Quartile Performers Operate High-Performing Facilities while also Minimizing Costs and Eliminating the Risk of Catastrophic Events**

# Illustrative Case

- Reduce deferred production by up to 50% a year
- Improve Oil production by 2% to 10% per year
- Reduce Monthly Operating expense by 20% to 40% by removing unnecessary field work

<b>For a 5,000 BOD, 150 Wells Operation</b>	<b>Amount<sup>1</sup></b>	<b>Unit</b>
Deferred Production Avoidance	\$4,517,000	Yr
Improvements in Oil Production	\$1,600,000	Yr
Savings in Field Operations Cost	\$721,000	Yr
<b>Total Potential Revenue Improvement</b>	<b>\$6,838,000</b>	<b>Yr</b>

- Improve safety by removing people from the road and from unnecessary visits to well sites
- Improve environmental compliance by detecting operational anomalies early

<sup>1</sup> Calculated @ \$55/Bbl



# Artificial Lift Solution Helps Large NA Producer Increase Production

## Customer Success

### CHALLENGE:

**No confidence that wells were producing at optimum**

- 4500 wells on plunger lift
- Operators relying on rule of thumb to optimize plungers
- KPIs sophisticated
- Needed a surveillance system to apply knowledge of SMEs systematically



### SOLUTION:

**Surveillance by Exception Applied to 4500 Wells**

- Integrated well equipment databases, SCADA data, historical production, GIS and other systems
- Monitored 43 complex KPIs, deployed across org and incorporated well review templates to augment alerts
- Implemented a knowledge capture system to illustrate common issues and response

### BUSINESS RESULTS:

**5-30%**



**production increase on all 4500 wells**

**50%**



**decrease in decline rate**

Reduced windshield time



Improved operator training



Reduced emissions



# Emerson's Digital Ecosystem for Unconventional Oil & Gas

## FOUNDATIONAL SOLUTIONS

Services

Project, Lifecycle, and Educational Services

## IIoT SOLUTIONS

**Consulting**

Operational, Digital Transformation

Analytics & Architecture

Oil & Gas Expertise

Analytics

**RTU / SCADA / ICSS Solutions**

Tank Management

Chemicals Management

Produced Fluids Management

Well Management & Lift Optimization

Fiscal Metrology

Well Test Management

**Operational Performance Software**

Mobile SCADA WiFi

Plantweb Optics

Surveillance, Analytics & Workflows

Plantweb Insight: Corrosion

Plantweb Advisor: Compressors

Dynamic Lift Optimization

Production Optimization

**Analytics as a Service**

Microsoft Azure

Connected Services: Multiphase Flow Meter

Connectivity

**Secure First Mile**

Edge Computing Secure Data Pathways

Data

**Intelligent Field Devices**

Level Interface Detection

Multi-Phase Flow Measurement

Coriolis Measurement

Electric Actuation

**Pervasive Sensing**

Pressure

Pressure Relief Valve

Radar Level

Toxic Gas

Non-Intrusive Temperature

Non-Intrusive Corrosion

# How Operational Certainty Helps

**Cross-Functional Consulting Expertise**

**Consistent Methodologies**

**Defined Performance Benchmarking**

**Digital Ecosystem**



**EXPERT PARTNERING**

## Strategy Alignment

Benchmarking

Strategy, opportunity & solution definition

Performance & information management consulting

Improvement program management

## Domain Expertise

Performance improvement & monitoring

Industry knowledge & application experience

Operational & business performance information flows

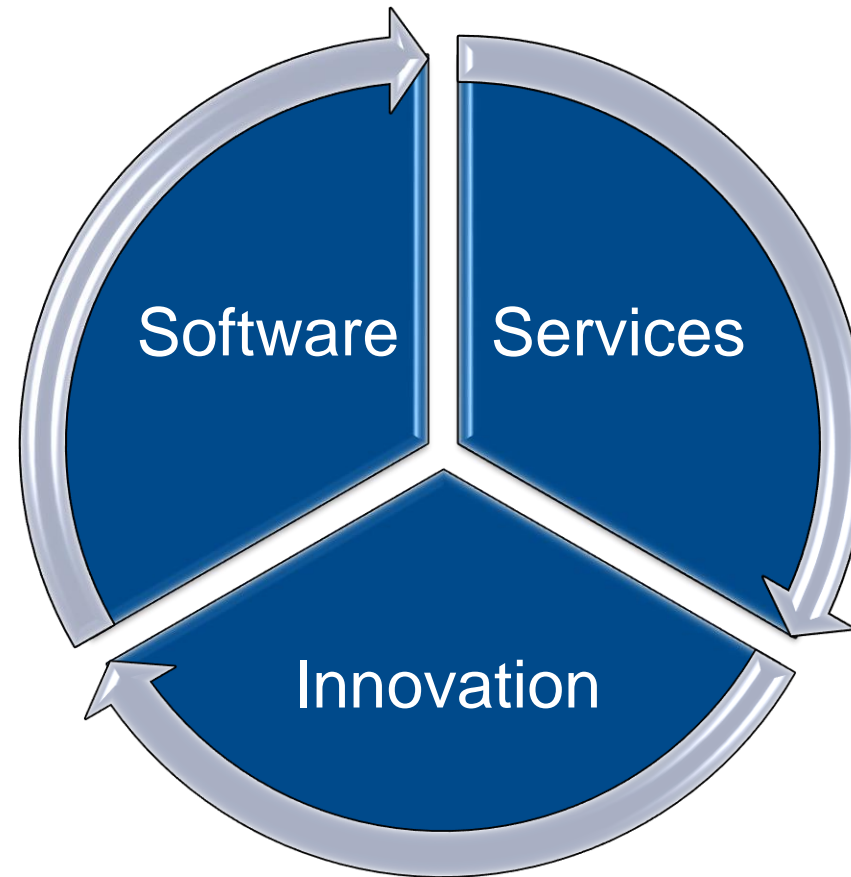
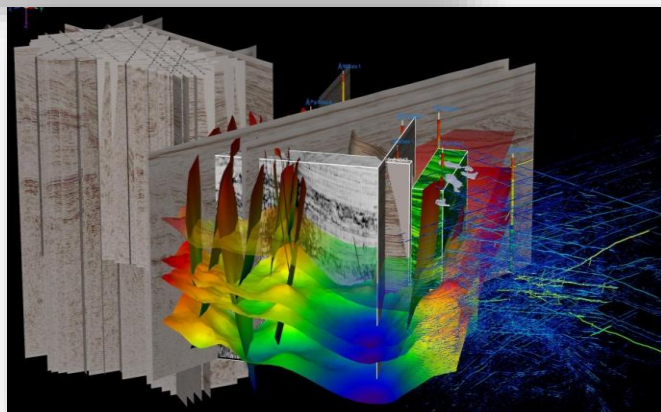
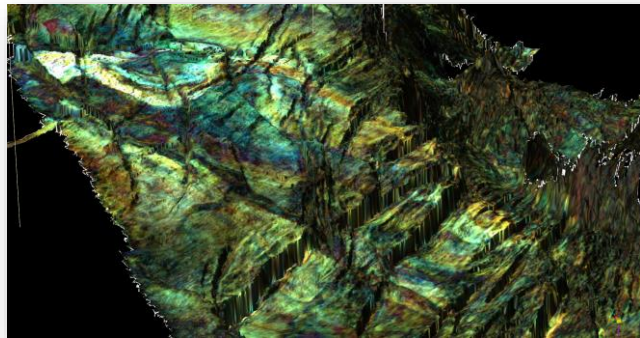
## Global Service

Training & competency development

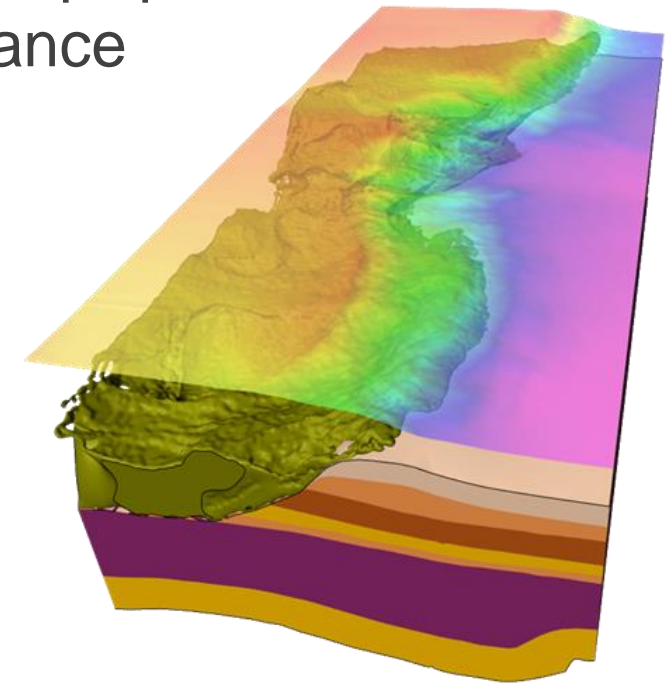
Local resources supported by global expertise

# Additional Emerson Capabilities

**Extensive E&P Software** to help customers find, model, and forecast reserves and production



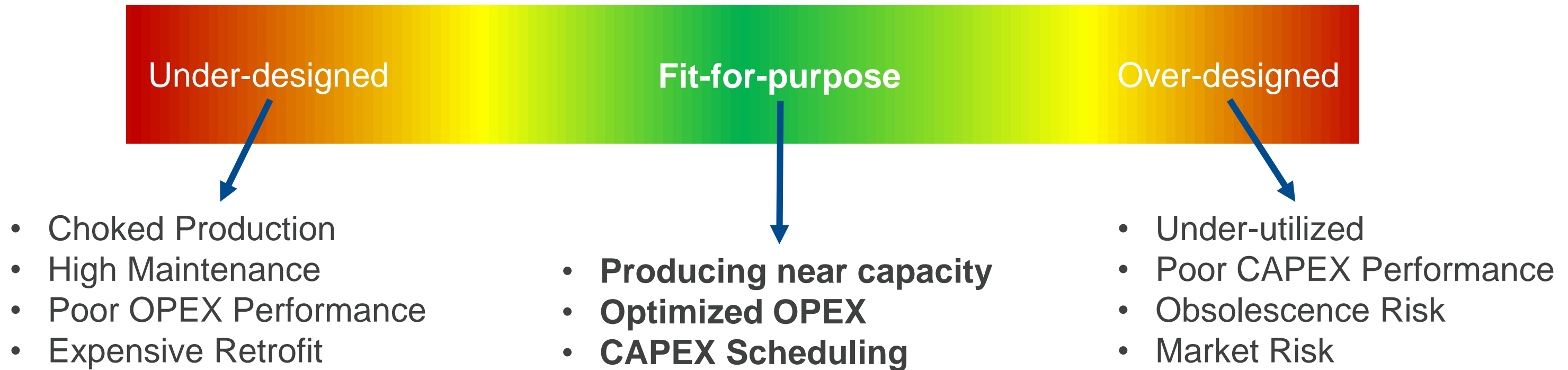
**High End Consulting Services** to help customers achieve top-quartile performance



**Custom Development** to help customers access and maintain next-generation technology

# How Do These Capabilities Help You?

## Design for life of field!



Put production evolution in the initial project plan



# The Path to Top Quartile Performance

## Addressing Your Challenges?

### How Emerson can help.

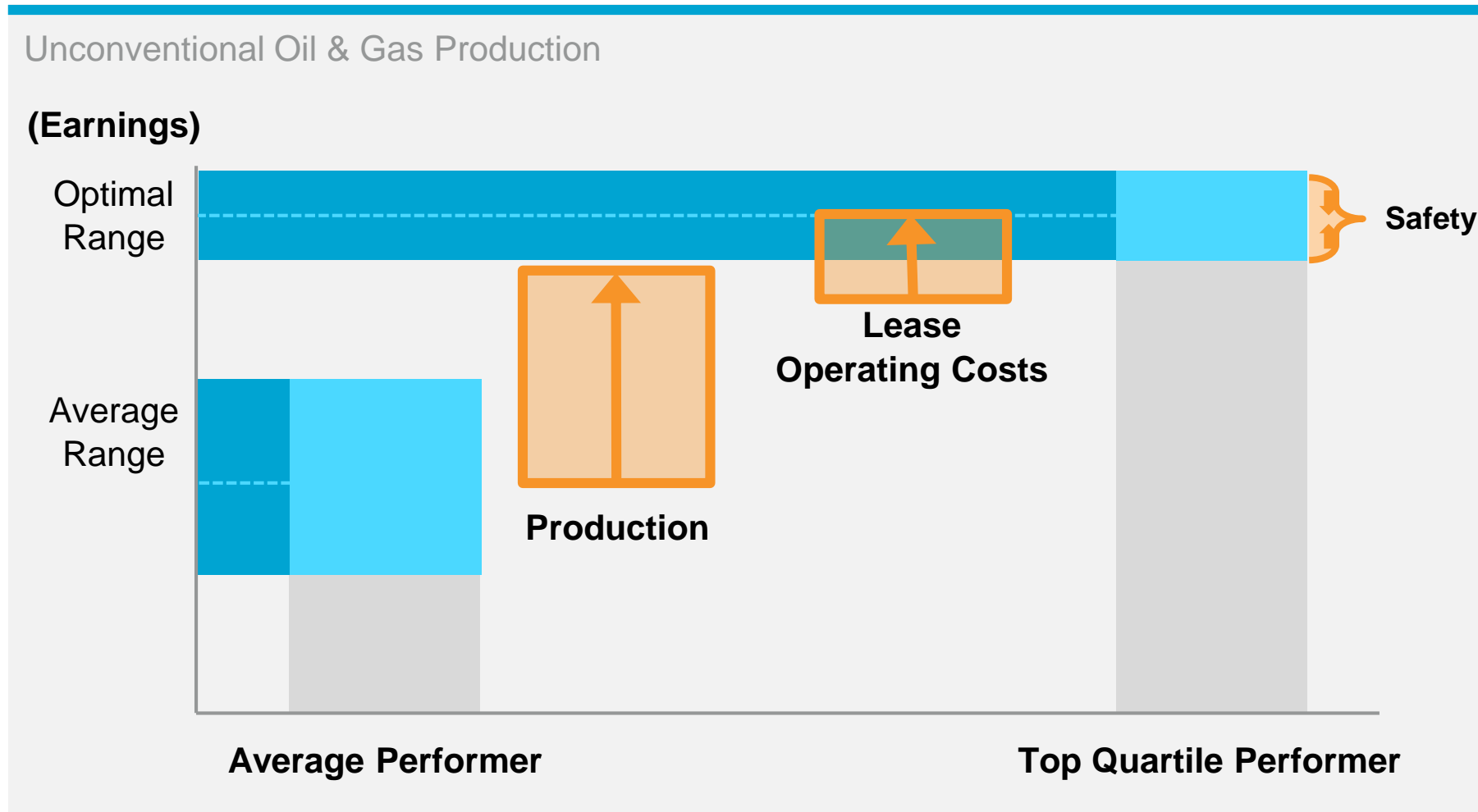
- Explore how our expertise and capabilities align to your desired outcomes
- Identify and prioritize programs with high business impact to help you achieve top quartile performance
- Develop a transformation roadmap to support and accelerate your strategic plan

### Payback can be fast

- Clients have seen investment payback of weeks to months

**Emerson has the breadth and experience to help you leverage automation technologies and services to achieve Top Quartile operational performance**

# The Opportunity is 6% EBITDAX Improvement



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**Partnering with Emerson on a Comprehensive Improvement Program to Deliver Shareholder Value**





# Operational Excellence for Unconventional

How Emerson can help your daily production  
match its true potential and get the most out of  
your existing assets

