Achieve Operational Excellence Through Continuous Improvement Initiatives in Oil & Gas
Overview

The oil and gas industry is currently operating in a volatile environment of depressed oil prices, alternate feedstock availability, global competitiveness, changing economics, and rising energy costs, etc. A comprehensive Continuous Improvement strategy that scopes a programmatic Continuous Improvement approach, implements an Online Performance Solution to drive its initiatives, and demonstrates benefits through Visualization can help the oil and gas industry achieve more efficient and flexible production, reduce operating costs, and promote a greener global economy. This will not only provide immediate savings today but will help drive operational excellence through continuous improvement well into the future.

Industry Challenges

Framing the need for continuous improvement means understanding the key challenges and drivers for both business decisions and investment into the future (Figure 1).

Lowering Operating Costs. The need for lowering operating costs is the result of an oversupply of oil, lower global demand, and rising energy costs.

Productivity. Boosting productivity means investing in new innovation and technology, accelerating careers through sophisticated training methods, and empowering personnel to drive operational excellence throughout the organization.

Safety. HS&E is one of the highest priorities in the oil and gas industry. In addition to regulatory compliance, operators must understand how to efficiently and safely operate the plant and the control system.

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Key Benefits

- Improved efficiency and productivity
- Lower costs and higher margins
- More efficient, flexible, and reliable production
- More highly skilled and agile operators
- Empowered employees across an enterprise
- Greater global competitiveness

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Figure 1: Oil & Gas Industry Challenges
A Comprehensive Continuous Improvement Strategy

The goal of an effective Continuous Improvement strategy is the pursuit of efficient, effective, and reliable operations to achieve optimal profitability for a process on a continual basis via incremental or breakthrough initiatives. It should drive improved efficiency and productivity, lower costs, and higher profitability; empower employees to persistently evaluate and improve processes with respect to their efficiency, effectiveness and flexibility; and help achieve more efficient and flexible production, more highly skilled operators, and greater global competitiveness.

A comprehensive Continuous Improvement strategy is achieved in three logical steps:

1. **Scope CI approach**
   - With the help of Schneider Electric services team, scope and develop a Continuous Improvement approach with complete scoping design, implementation, and reporting.

2. **Implement technology**
   - Implement SimSci Online Performance Suite technology to drive continuous improvement initiatives in real-time.

3. **Demonstrate benefits**
   - Demonstrate economic benefits for key stakeholders via Wonderware visualization tools.

Figure 2: Schneider Electric’s Comprehensive Continuous Improvement Strategy
Step 1: Scope a Continuous Improvement Approach with Schneider Electric Services

Continuous Improvement is a journey, not a destination. It begins with a thorough Continuous Improvement approach that addresses responsiveness across five distinct areas—(i) Objectives, Measurement & Incentives, (ii) Planning & Scheduling, (iii) Plant Configuration & Equipment, (iv) High Consumption/Low Efficiency Components, and (v) Operational Discipline & Performance. The strategy is executed in a repeatable, programmatic manner:

1. **Plan & Develop** a Continuous Improvement program, estimating size and scope of the project with an expected roadmap.
2. **Design & Execute** methodology—process and information flow and decision-making—at sites in order of priority.
3. **Rollout & Report** the economic benefits of the program.
4. Seek approval to repeat the program at additional sites.

For more information on the comprehensive nature of this approach, [download the whitepaper](#).

Step 2: Implement SimSci’s Online Performance Suite to Drive Initiatives in Real Time

As operating costs (feedstock, energy prices, etc.) become more volatile, plants feel more out of control. With no access to current costs to make informed decisions, nor the plant flexibility to be responsive, they are not typically equipped to make rapid changes. Although substantial investments have been made in plant efficiency and cost management over the past few years, they have had limited impact (Figure 3).

**Figure 3: Technology Solutions That Don’t Work**

- **POINT SOLUTIONS:** often have unintended consequences because they typically fix one problem but create others
- **CONSUMPTION-BASED SOLUTIONS:** reduce consumption but only so far as to not impact output
- **DATA-CENTRIC SOLUTIONS:** provide lots of data but not necessarily what’s needed to control the things for which each role is accountable
- **ECONOMIC-BASED SOLUTIONS:** capture changes in operating costs but often outrun any ability to react
A single technology solution is required to improve efficiency, productivity, and profitability, drive global competitiveness, and pursue operational excellence on a continuous basis and in real-time. Schneider Electric provides an integrated Online Performance Solution that captures models, data, and these required capabilities:

<table>
<thead>
<tr>
<th>Product</th>
<th>Description</th>
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<tbody>
<tr>
<td>SimSci PRO/II</td>
<td>Improve process design, operational analysis, and perform engineering studies.</td>
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<tr>
<td>SimSci Spiral</td>
<td>Manage crude oil data and property prediction. Optimize crude oil purchasing to meet specified production targets, while considering utility and production costs.</td>
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<tr>
<td>SimSci APC</td>
<td>Reduces variations in the process, allowing for operation much closer to the operating limits, on a unit by unit basis.</td>
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<tr>
<td>SimSci ROMeo</td>
<td>Provides performance monitoring, data reconciliation, and optimization for the entire plant in real time.</td>
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<tr>
<td>Wonderware Historian</td>
<td>Capture data in real-time and connects to DCS and ROMeo for data reconciliation.</td>
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<tr>
<td>SimSci DYNSIM</td>
<td>Run a dynamic model of a process, with control system design, operational analysis, controls checkout, and operator training capabilities.</td>
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<tr>
<td>Foxboro EVO Simulation</td>
<td>Built on DYNSIM, emulates the plant’s regulatory control system (DCS, PLC, SIS) for CP270/280, Triconex, Foxboro Evo, 3rd party.</td>
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<tr>
<td>SimSci EYESIM</td>
<td>Trains operators/engineers on the plant and its control system in 3D.</td>
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Figure 4: Shows the configuration of this Online Performance Solution and its implementation in the plant.
It works like this: 1. An initial process design with preliminary operating conditions is created in PRO/II typically during the FEED process; it is the basis for optimization. 2. Daily production planning targets and pricing are executed through the Spiral Suite linear programming model and fed to the optimizer. 3. Crude assay data is extracted from the Spiral Suite database and used in ROMeo and PRO/II. 4. Process data is collected at regular intervals by Wonderware Historian. 5. Data is checked for normalcy and validity by ROMeo where data tuning ensures the tolerance of the collected measurements is corrected. 6. ROMeo executes the plant optimization calculation once every couple hours or daily. It uses the steady state simulation to continuously identify the plant is at steady state and is executed on a minute or hourly basis. 7. The real plant is controlled by SimSci APC based on these new optimal setpoints from ROMeo. 8. Regulatory control systems, in the form of emulators—SCP, TRISIM Plus, Foxboro Evo Simulation, and 3rd party control processors (DCS, PLC, SIS)—identify and set process constraints. 9. Operator training for the plant, controls, and systems is performed based on a medium to high fidelity dynamic simulation models in DYNSIM.

For more information on the impact this software solution has on performance, download the whitepaper.

**Step 3: Demonstrate Economic Benefits Through Wonderware Visualization**

To adequately demonstrate the benefits of a Continuous Improvement program to appropriate decision-makers, intelligent visualization is employed. This can take many forms, such as consumption plots, leading and lagging KPIs, and dashboards (Figure 6).

For more information on the implementation of visualization options, download the whitepaper.
How You Can Implement a Successful Continuous Improvement Strategy

Schneider Electric can help you pursue efficient, effective, and reliable operations to achieve optimal profitability by executing successful Continuous Improvement initiatives. Download the whitepaper to find out how.