



WHITE PAPER

A silhouette of an oil field worker standing on a metal structure, holding a hard hat in one hand and a tool in the other, with a sunset in the background.

Operational excellence through to the oil and gas frontline.

OCTOBER 2021

Oil and gas operations are at a pivotal moment.

Three industry demands are converging to make this a defining moment for operational excellence in oil and gas.

Globally, upstream companies can save up to \$37 billion from improving maintenance and field operations by 2030, according to **McKinsey**. However, that isn't news to producers who have sought to operate lean and reduce OPEX for years.

What makes this a pivotal moment is that demand for economical production and emissions reduction are being met with a pending labour shortage. That combined pressure is pushing operations teams to find new ways to level up performance through to the frontline.

According to **Bain & Company** the need for operational excellence has never been greater. Exploration, development and production costs are rising, and refining margins are under pressure. Activity levels are also increasing, causing sector inflation. A shortage of technical talent and capability has bid up the cost of employees and services even further. Because one in four technical professionals will retire in the next few years, this shortage could become even more severe.

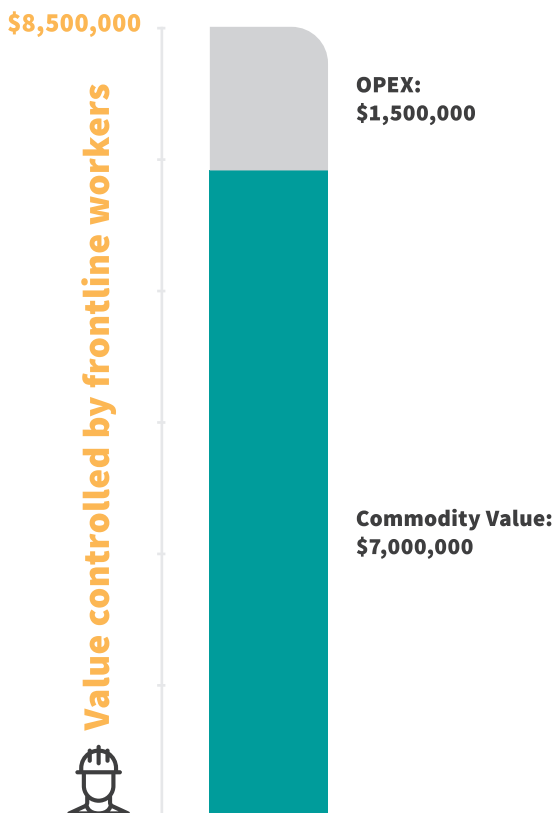


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Having tested the limits of challenging operations teams to 'do more with less' people and less operating expense, oil and gas producers are looking at new ways to improve operational excellence including workforce performance. A growing number of companies are deploying field operations technology to reduce operations costs, compliance risk, and the cognitive load on workers. If we look at the success stories among E&P companies leading the shift toward operational excellence, a number of success factors emerge that can guide other producers.

Rising OPEX costs and field incidents are motivating change at the frontline.

Pressure to reduce operating costs has hammered the oil and gas industry for the last several years. Every producer is looking for ways to take preventable costs and downtime out of their operations, not just for a quarter but for long-term economical production.



In North America, on average, every frontline oil and gas worker controls about \$8.5 million in value each year. That breaks down to about \$1.5 million OPEX, and about \$7 million in value of the commodity they're pulling out of the ground. It's an incredible amount of responsibility. And under pressure to generate more performance with less - fewer people, fewer resources, and in less time. Due to this, operations teams can make mistakes that add new costs.

According to **Aveva** and data from ARC Advisory Group and J&H Marsh & McLennan, operator error accounts for 42% of unplanned shutdowns across industrial businesses, including oil and gas. The average cost per major incident related to operator error exceeds \$80M.

Significant incidents may seem like edge cases but consider downtime. ARC estimates the average impact of unplanned downtime in the process industries alone is \$20 billion, or almost 5 percent of the annual production.

Reliability experts estimate that unplanned downtime costs ten times as much as planned downtime for maintenance. Leading causes of unexpected stoppages in production are preventable equipment failure and operator error. Furthermore, the consequences include equipment damage, lower performance, environmental harm, and worker endangerment.

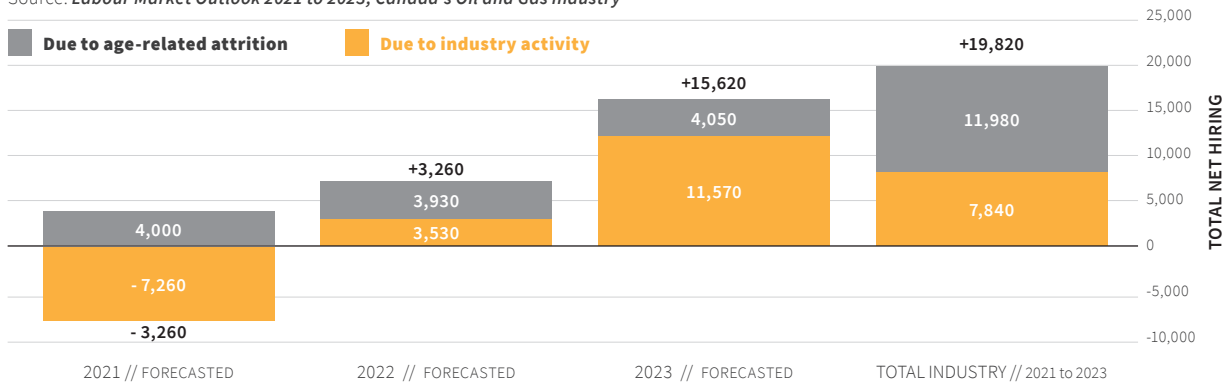


Forecast labour shortages are set to put more pressure on the field.

The pressure to do more with less isn't going away for operations teams. Oil and gas companies are about to face a wave of retirements that will deepen the shortage of people to do operations work. Over the next three years, more than 60% of oil and gas job openings will be due to age-related attrition.

INDUSTRY NET HIRING REQUIREMENTS FORECAST

Source: *Labour Market Outlook 2021 to 2023, Canada's Oil and Gas Industry*

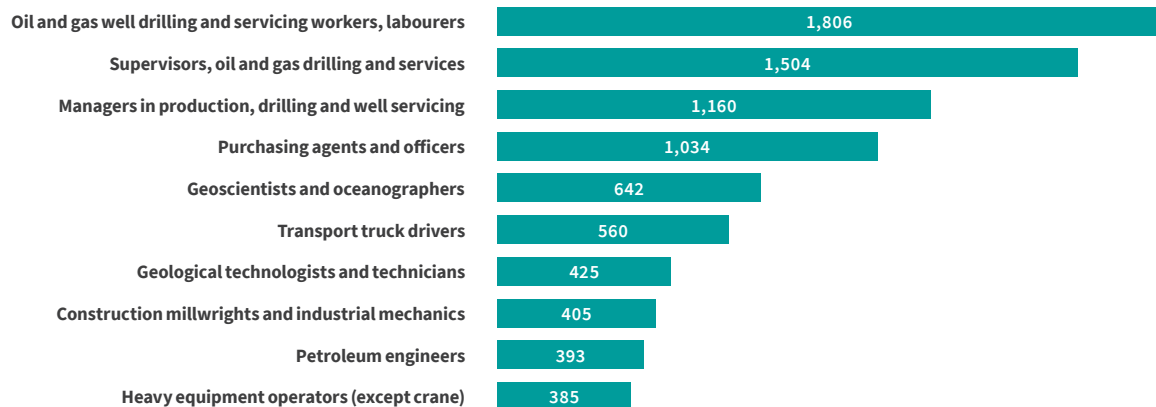


The majority of forecasted openings, through to 2023, will be in operations management and frontline oil and gas field positions.

WHERE THE JOBS WILL BE

Occupations with the greatest net-hiring requirements from 2021 to 2023.

Source: *Labour Market Outlook 2021 to 2023, Canada's Oil and Gas Industry*



The Labour Market Outlook states that in 2022 and 2023, the industry is expected to improve productivity through efficiency, competitiveness, and sustainability rather than increasing production. This includes the use of technology, digitization, automation, and data.

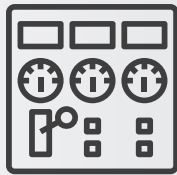
Data volume and extra compliance tasks have become unmanageable for operations teams.

So far, oil and gas operations teams have seen the arrival of data but not yet automation of their day-to-day activities.

Most operations have become a data spiderweb as Industry 4.0 brought with it IIoT and data monitoring and added control systems. Operations teams now face the challenge of monitoring more data from more sources, including pump-off controllers for oil wells, digital chart reading solutions, and leak detection systems for high-risk pipeline segments. Compliance requirements have led to more data entry into multiple systems.

DIGITAL OILFIELD

Digitization & Process
Improvement



Automation

Equipment Asset Management

Control Systems (HMI, SCADA, etc.)

IIoT

Asset Integrity

Process Simulation

EXECUTION GAP



HUMAN ACTIVITY

Work that still must be
done by people

Operator Training

Shift Logs

Inspection

Procedures (Operating, Emergency, Maintenance, etc.)

Planning & Schedule

Cross Team Communication

AUTOMATION ASSISTED

NON-AUTOMATED

Without tools to synthesize the data and with emails, spreadsheets, and phone calls layered on top it can become nearly impossible for operations managers to make consistent, quality decisions. Experience may help with some judgment, but that leaves experienced field operators under tremendous pressure to solve problems, often with long hours and high stress.

Disconnected data is also contributing to time-consuming error-prone reporting, including to industry regulators.

New tools are required to guide operator decisions as retirements continue.

More oil and gas companies seek to augment their operations teams' human performance with technology to address the labour shortage, even while they continue to operate lean.

ARC advises that reducing incidents and preventable downtime requires standards-based technologies that synthesize inputs from hardware, software, and infrastructure systems. Their recommendation is to use technology to reduce the complexity of operator decisions and streamline communication and reporting across a producer's operations.

Field operations software was developed to suit this need. This operations software synthesizes operations data and provides field teams guidance on highest-value field activity for the day. The technology automates key field activity to refocus time on optimizing production and proactive compliance and improves data quality for reporting.

By equipping operations teams with software to streamline their work and guide them on the top priority activities, considerable OPEX savings can be realized.

STANDARD CORE CAPABILITIES OF FIELD OPERATIONS SOFTWARE



Digitize Data



Real-Time Communication



Streamlined Compliance



Prioritized Activity

The value generated by operations technology & operational excellence.

The return on investment of using technology for operational efficiency is increasingly well documented. The value generated centres on reducing OPEX, reducing carbon emissions, and improving job satisfaction for workers.

OPEX is the highest controllable cost for oil and gas companies. In many cases, it is higher than G&A, interest expense, royalties, and transportation costs combined. By equipping operations teams with software to streamline their work and guide them on the top priority activities, considerable OPEX savings can be realized.

In one case, a natural gas E&P company reported substantially reduced operating costs, emissions, and drive time after using EZ Ops field operations software for 12 months. Their results were:

18% OPEX REDUCTION

EZ Ops equipped the company to reduce OPEX by decreasing maintenance and chemical costs, as well as chemical hauling and disposal costs.

TOP 5 AREAS OF OPEX SAVINGS

1. Road maintenance: **\$374,850**
2. Trades people, Parts & labor: **\$322,500**
3. Chemical methanol: **\$179,800**
4. Chemical hauling: **\$131,040**
5. Production / disposal trucking: **\$92,380**



Man hours saved:
3,632

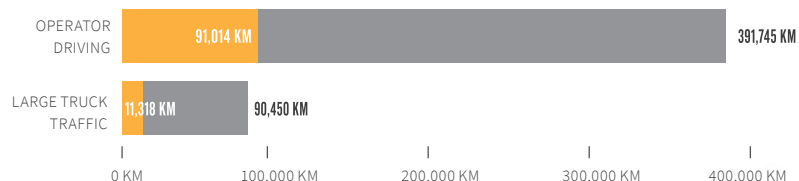
Operator savings:
\$233,238.48



80% LESS ROAD TIME

■ Without EZ Ops ■ With EZ Ops

Optimized work scheduling with EZ Ops reduced operator driving time and large truck traffic.



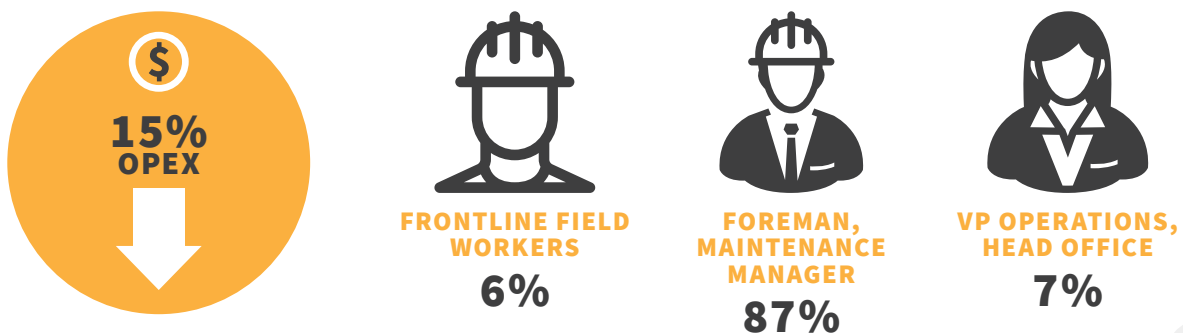
80/20 CLARITY ON KEY ACTIVITIES

Reduced field management from 11 to 6 members and resulted in less stressful, shorter days for the field operations team

Role of head office, management and frontline workers in performance.

In order to generate strong returns from investment in operations technology, data from North American oil and gas producers shows a cross-functional effort is required.

Consider how operations technology can reduce OPEX, for example. A reduction of at least 15% is common if a producer makes changes in operations behaviour through to the field frontline.



For OPEX savings, 87% of value is generated by foremen and maintenance managers, 7% by head office operations and compliance teams and 6% by oil and gas frontline workers. Below, the break out of activity that drives the savings helps explain the cross-organization effort required.

WHAT USAGE OF OPERATIONS TECHNOLOGY DRIVES MONETARY SAVINGS?

TECHNOLOGY USAGE	ESTIMATED SAVINGS (\$)
Prioritized Tasks	\$320,000
Tank Readings	\$600,000
Pump Readings	\$200,000
Machine Schedules	\$100,000
Inspections	\$100,000

Total Savings: \$1,320,000

Making a successful shift in operations.


Industry data on successful operations transformations show companies have three factors in common: leadership commitment, cross-functional direction, and a focus on building operations team capacity.

Leadership commitment. The shift to operational excellence requires senior managers to champion operational performance and know what success looks like - even if goals are aspirational. They have clear performance expectations for both leading and lagging indicators, such as time between equipment failures, well test compliance or drive and trucking distances for asset management in a period. There's a leadership commitment in executive time and budget that supports achieving targets - both establishing accountability and supporting operations performance through to the front line.

Cross-functional involvement. Oil and gas companies that have meaningfully moved forward with operational excellence started by assembling a team that fully represents operations from head office through to the frontline. Steering groups often include a vice president or operations manager, production or petroleum engineer, superintendent and foreman. And any technology evaluation steps or trials included several field representatives. For larger organizations, leaders in ESG and HR are also proven to be valuable.

Building operations team capacity. Critical to transforming operations is investing in technology to equip operations teams to perform at their best. Organizations need to implement operations technology to draw on the data available and equip operators to conduct the highest value activity every day, support learning on the job and enable consistent performance. The technology must also streamline communications, provide visibility into operations data and support timely, accurate reporting all with less manual field effort.

Over the past few years, generating value in upstream operations has shifted from developing new fields to delivering world-class operational performance. Today, oil and gas operators compete in an economic, environmental and recruitment environment that demands operational excellence in cost efficiency, production volumes and in a supported workforce.



More oil and gas companies seek to augment their operations teams' human performance with technology to address the labour shortage, even while they continue to operate lean.

Technology partners for operational excellence.

EZ Ops authored this white paper to inform and support oil and gas producers as they seek to equip their operations teams to produce the cleanest and most profitable hydrocarbons in the world.

We first created EZ Ops operations software to equip our own team to focus on the top priorities for action to boost asset performance and reduce OPEX with greater job satisfaction. Since then, we've earned a 100 percent field adoption with many industry-leading producers.

Recently, EZ Ops received an additional \$1 million investment to advance operational excellence in oil and gas with artificial intelligence and machine learning driven technology. We're collaborating with our customers on industry needs and welcome new partnerships with other leading producers.



We can help.

Assess how to improve your operations team performance.

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