DETECHTION
Enabling the Digital Oilfield

Reducing Lease Operating Expenses for Oil And Gas Production

The oilfield is changing with millions of assets often unmonitored, much less optimized, to deliver lower operating costs while maintaining top production. Lowering your Lease Operating Expenses (LOE), operating lean, all while maintaining safety and regulatory compliance requires a new, digital approach.

TOPICS

01

Why the Current Oil & Gas Production Affects LOE

Oil and gas production has encountered a world-historic challenge in the form of COVID-19. Oil futures briefly traded in the negative numbers during April 2020. Current oil and gas prices are only just beginning to improve alongside positive news about a potential vaccine for the novel coronavirus. Yet, many major and super major companies are merging in an attempt to survive.

When oil and gas prices are low, the natural imperative for any oil company is to reduce both production and costs. Shrinking supply helps increase demand, helping to return prices to normal. Meanwhile, reducing LOE costs allows the company to husband its war chest, ensuring that it can manage staff efficiently and remain equipped so that it can return to a normal operating cadence once the recession breaks.

02

Case Study: LOE Reduction Challenges in the Permian Basin

In order to take a look at the challenges facing the industry at large, let's look at a microcosm (albeit a large one) for an example. The Permian Basin, which is still one of the largest oil and gas producing regions in the world, is experiencing new challenges as well as aging and declining production.

Natural gas prices are only now beginning to approach the $3.00 level once again. During periods of low prices, natural gas produced by an oil well represents a headache.

Producers can't sell this commodity at a profit, and so they're forced to simply flare or vent it at a loss. Additionally, West Texas Crude or Intermediate production has slackened, replaced by a new grade called West Texas Light. Compared to West Texas Crude prices, West Texas Light normally costs up to $2 less per barrel.

Oil companies in the Permian Basin are reducing their drilling operations (or having this necessity forced on them) while also attempting to decrease LOE. Their traditional methods have included:

- Deferring maintenance expenses
- Divesting properties with higher costs
- Cutting production
- Furloughing personnel

The problem with the traditional approach is that the COVID-19 crisis is just the latest expression of a new normal in terms of lower oil production and lower gas prices. Producers can't defer maintenance until production ramps up again because that may never happen. Not only will the pumps go offline, but the infrastructure will also fail in more-or-less permanent ways. There will be no way to resume production once prices return to normal if they ever do.

What's more, producers can only cut production so much. Our natural gas clients have recently experienced problems because running their compressors at reduced flow rates risks damaging the equipment. Oil producers face similar risks. Running production equipment below normal operating thresholds can cause it to behave in unexpected and undesirable ways—paradoxically increasing maintenance costs at the same time that decreasing LOE is most important.

Instead of relying on traditional methods to reduce LOE, E&P companies should instead begin to focus on the creation of digital oilfields by instrumenting them with Industrial Internet of Things (IIoT) devices. For instance, implementing IIoT can lower LOE by helping producers extend calendar-based scheduled preventative maintenance (PM) with usage-based (e.g., run hours) PMs. And using Asset Performance Management (APM) software using IIoT data can even replace preventive maintenance with predictive maintenance.

Most equipment manufacturers recommend a certain cadence of planned downtime and repair for the oilfield equipment that they produce. Most operators find that this cadence is too conservative in some areas and too reckless in others—it's a classic case of a plan not surviving contact with real-world operating conditions. Following the manufacturer's recommendations exactly can result in scheduling planned downtime (and the accompanying revenue loss) for no good reason—and conversely, it can lead to much more costly unplanned downtime due to unforeseen issues.

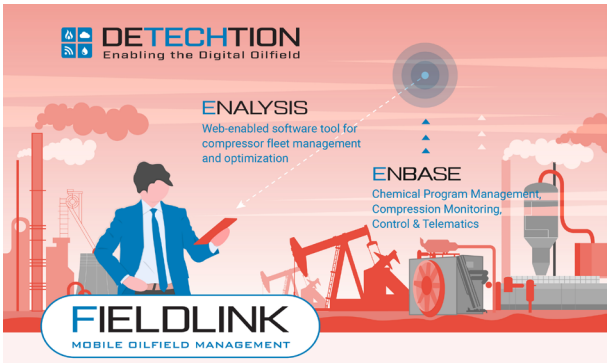
As such, oilfield operators tend to create their own operational cadence based on their experience, but experience can still be faulty. This is one reason why the advent of IIoT has so much potential—because it can help create maintenance schedules and operational cycles based on a greater range of empirical evidence. Imagine being able to detect an equipment failure months in advance because of a minute change in vibrational frequency—and then being able to replace that part before it fails in operation.

In a nutshell, using IIoT can make traditional maintenance schedules a thing of the past. Operators can schedule less maintenance and leave equipment running for much longer without interruptions. They can then make more precise repairs and adjustments, resulting in shorter periods of planned downtime. At the end of the day, this single aspect of IIoT can help oil and gas producers reduce their LOE and increase their revenue—allowing them to grow their profits independently of the commodity market.

03

The LOE of Production

Maintenance is only a single (and very broad) aspect of a multidimensional picture when it comes to LOE. In addition to capital equipment maintenance, E&P companies must marshal the labor force to conduct maintenance and ongoing operations, dispose of saltwater produced as a byproduct, and manage chemicals used in the production process. As it stands, many if not necessarily most companies could stand to optimize at least one of these processes in order to reduce their LOE.



By using IIoT (Enbase) to monitor compressors, Fieldlink to digitize related compressor maintenance activities and workflows, and Enalysis to optimize compressors, a producer can:

Transition from calendar based to usage based preventative maintenance schedules

Reduce downtime and mean time to repair by dispatching the right person with the right skills and the right tools on an unplanned shutdown

Dispatch and capture PMs and unplanned callouts electronically to improve transparency, accuracy, and efficiency

Identify production optimization opportunities

Identify predictive maintenance opportunities

- **Identify and repair problems before they occur**
- **Reduce unplanned callouts, downtime, and associated lost production and repair costs**
- **Push out PMs that may not be needed**

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Optimizing Compressors to Rescue Gas Wells

As a well grows older, the amount of oil or gas that it produces via free flow will begin to decline significantly. Using a wellhead compressor for gas lift lowers the density of the fluids inside the well, making it easier to extract oil and unlocking years of extra production potential.

Maintenance is a significant concern here—as it should be in a machine designed to reduce the atmospheric pressure in a shaft that reaches an average of nearly 6,000 feet deep. The primary challenge for operators is to ensure that the compressor generates enough production to exceed its ongoing operating costs, and maintenance is a large part of this. It is not the only part, however.

One way to reduce LOE is to reduce routine maintenance and inspection trips to the compressor itself. Instead, producers can instrument the compressor and use sensor reading to determine whether the machine can operate safely. This lets producers remotely restart their compressors without arranging an inspection tour, dramatically cutting planned downtime and increasing production.

Environmentally Compliant Disposal

The same frangible rocks that contain oil and natural gas also contain saltwater, which is then produced as a byproduct of drilling. On an offshore oil rig, disposing of this byproduct is usually as simple as letting it flow back into the sea. Inland oil wells such as those found in the Permian Basin will experience more complex challenges.

On land, saltwater is an environmental hazard that can poison ecosystems, and its treatment has to be carefully considered. The most common choice is to drill a second dry well alongside the first one, pump saltwater into it, and then cap the well with a non-porous rock.

It can be difficult to coordinate the disposal of wastewater in this manner. The material should be pumped as soon as possible, and every day that it remains aboveground represents an additional storage cost. In order to minimize LOE related to saltwater, producers should expedite disposal using the right mix of personnel and equipment. If an operator mismatches its disposal capacity with its need to dispose of saltwater, then it's paying unnecessary overhead.

Saltwater Separation and Pipeline Maintenance via Chemical Mechanisms

Chemical treatment is a foundational step in the oil production process. Separating crude oil into its various grades is an intensive process that doesn't start at the refinery, but rather at the well itself. Chemical additives help separate oil from saltwater, thin out paraffin and asphalt to prevent blockages in the well and pipelines, clean emulsions on the bottom of tanks, and prevent wells from becoming shut-in. Purchasing and deploying these chemicals can represent a major component of a company's LOE.

Once again, there are several variables that control whether a production company is spending wisely when it comes to chemical management. For instance, are batch (or "truck") treatments occurring at the correct frequency and intervals? Or are the correct amount of chemicals injected for continuous chemical treatments? Underdosing chemical exposes the operator to expensive equipment damage, or even well shut-ins that result in both lost production and costly well workovers. On the other hand, overdosing results in wasting chemicals.

By implementing IIoT sensors within its environment, the company could achieve an empirical understanding and adjust injection or dosage rates when necessary. In addition, producers can optimize their use of chemicals with flexible automation, allowing them to stop chemically treating shut-in wells, or automatically change their use of chemicals based on fluctuating weather conditions.

Optimizing the Labor Pool for Efficient Operations

Labor, like maintenance, is a fairly broad aspect of a multidimensional LOE picture. A traditional oil well utilizes labor during almost every stage in the production process, but out of necessity, this is beginning to change.

During the early part of the 2010s, the oil industry went through what's known as The Great Crew Change. A huge portion of the workforce retired—taking their institutional knowledge with them—and leaving much of the remaining personnel composed of under-35s. Additionally, low oil prices have depressed hiring budgets, which means that there isn't much new talent entering the field.

Lease operating expenses surge when this newly shrunken workforce is deployed ineffectively. When equipped with mobility options and industry 4.0 applications, each crew member can cover a large area, addressing problems remotely and preemptively. Companies can always ensure that their crews are equipped to do the job they're assigned, minimizing repeated trips. In addition, they can ensure that their crews prioritize the most important tasks—instead of running down the same rote checklist every time they visit a production site.

To mitigate the LOE, oil companies need a solution that does more than simply reduce maintenance costs. They need an expansive digital toolkit that helps them optimize their operational expenses over every aspect of the production process.

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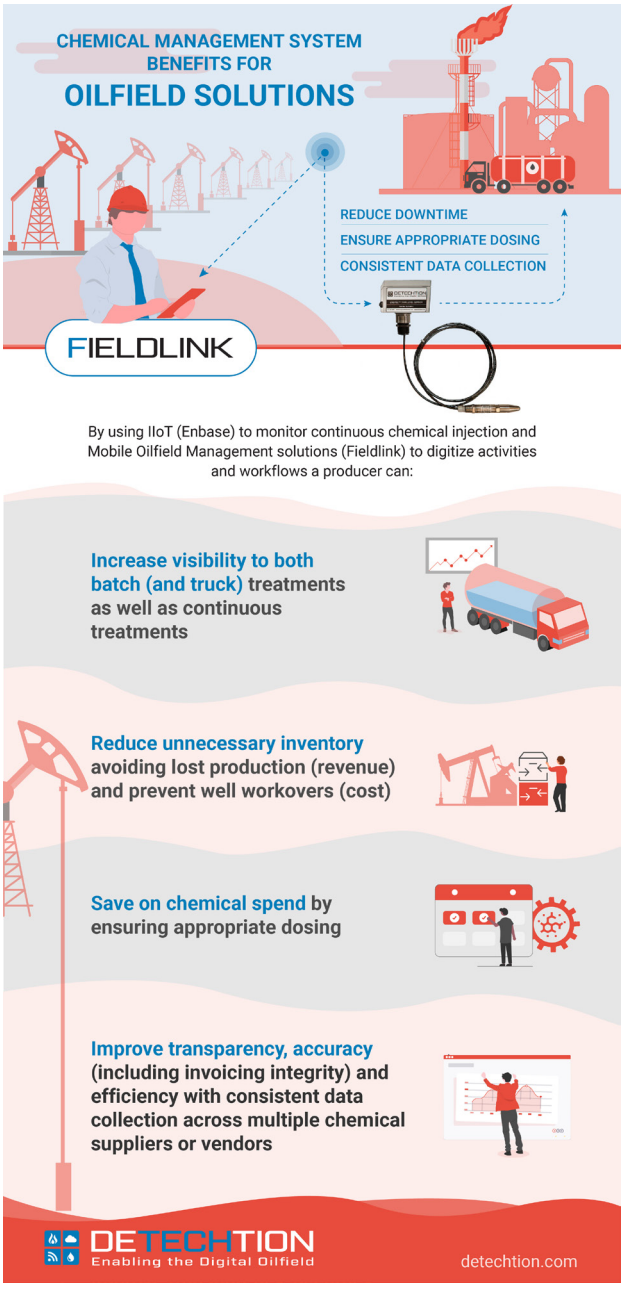
How Digitization and Asset Optimization Reduces Oil and Gas LOE

When it comes to managing equipment, chemicals, personnel and data, oil and gas producers have a long way to go. Although many companies have begun to implement automation, few have holistic solutions that cover more than just machinery. Here at Detechtion Technologies, however, we offer solutions that cover the full spectrum of challenges that producers face.



Optimize Natural Gas Compression Programs

All three of Detechtion's flagship products help producers get the most out of their compressor technology:

- Enbase IIoT delivers timely and accurate visibility to their compressors' status, including alerting on unplanned shutdowns and an understanding of true asset availability. With this insight and knowledge, producers can save costs by pushing preventative maintenance schedules based on actual run hours. Additionally, they can reduce downtime and mean time to repair by dispatching the right person with the right skills and the right tools.
- Enalysis APM identifies predictive maintenance opportunities to identify (and repair) problems before they occur, reducing unplanned shutdowns and associated downtime, lost production, and expensive repair costs. Operators can save additional costs by using this insight to further extend PM schedules when needed.
- Enalysis also identifies production optimization opportunities to increase throughput or reduce fuel/power consumption – or sometimes both! And these opportunities are ranked for the producer with predictive maintenance opportunities based on associated cashflow at risk to ensure that the operator is sending field workers where they can make the biggest impact on the business.
- Fieldlink Mobile Oilfield Management allows field workers to collect additional asset data that is not instrumented (no sensors) from any device—phone, tablet or computer. Fieldlink also empowers operators to dispatch field workers electronically for proactive activities like preventative or predictive maintenance and optimization opportunities. Or for reactive needs like unplanned shutdowns thereby improving transparency, accuracy and efficiency. If an asset needs attention, Fieldlink will surface that information to the appropriate field-worker as well as engineers and managers.

Run Efficient Chemical Management Programs

Effectively managing an oilfield production chemical program requires the operator to manage both their batch and continuous programs across multiple chemical providers. Your workforce, including your chemical providers, needs a streamlined and holistic solution that that covers both the batch and continuous treatments, as well as other associated chemical activities such as lab analysis.

By using Enbase to monitor continuous chemical injection and Fieldlink to digitize activities and workflows (for both truck treatments as well as continuous treatments) a producer can:

- Reduce downtime avoiding lost production and prevent well workovers
- Avoid expensive equipment damage
- Ensure appropriate dosing which saves on chemical spend while assuring production flow
- Improve transparency, accuracy (including invoicing integrity) and efficiency by consistently collecting data across multiple chemical suppliers/vendors

Bring Digital Transformation to the Oilfield with Fieldlink

When different parts of an organization can't freely share information with each other, production suffers. Communication turns into a game of telephone—a sheet of paper on a clipboard turns into a spreadsheet which turns into an email. Every jump between medium is an opportunity to lose or misinterpret information.

Fieldlink solves this problem by delivering a single platform and user interface for all oilfield activities, digitizing previously paper forms and automating previously manual and fragmented business processes to provide full transparency and auditability of work performed by both employees and third-party oilfield service providers. For operators, this provides proof of service for outsourced oilfield activities ensuring invoicing accuracy and integrity. It also importantly provides transparency and helps drive service provider performance.

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About Detechtion Technologies

The oilfield is changing. We are here to help, with solutions for chemical programs, compression fleets, and digitizing processes used by oilfield personnel.

As the leading asset optimization company for upstream oil and gas, we help producers achieve better operations by:

- Improving production
- Enabling manage-by-exception processes,
- Avoiding unnecessary equipment shut down
- Gathering data cost-effectively
- Preventing costly equipment repairs
- Streamlining ticketing and other supplier processes

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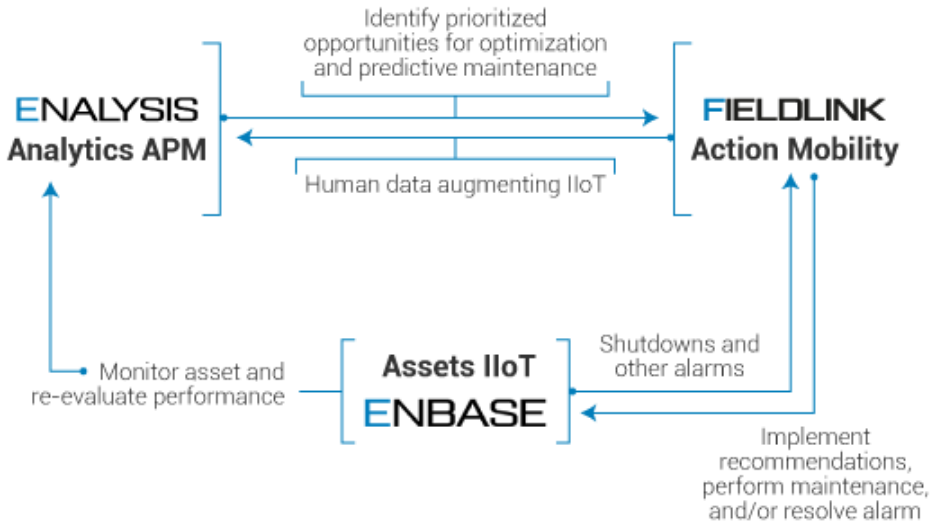
There are millions of oilfield assets and many are unmonitored, much less optimized to deliver lower operating costs while maintaining top production. Lowering your LOE, operating lean and maintaining safety and regulatory compliance requires a new, digital approach.

Industry analysts report that asset optimization is being rapidly accelerated through the adoption of IIoT. Our experience with producers confirms two things. First, data acquisition from remote assets and digitizing data from field workers is an acute problem in the oilfield. Secondly, the benefits from digital technologies can drive meaningful improvements to operations.

Detechtion is a leader in asset optimization. We accomplish this by delivering a unique product suite of Asset Performance Management (APM), Industrial Internet of Things (IIoT) and Mobile Oilfield Management solutions.



Each product improves oilfield operations. Used together, they enable best-in-class operations, leading to lower operating costs and improved production.

We know our customers' business because we focus exclusively on Upstream and Midstream Oil and Gas. We deliver digital transformation and optimization of natural gas compression, oilfield chemicals and other production operations, saving our customers millions of dollars per year.

If you feel as though the economic climate has put a ceiling on your ability to generate revenue and appease your investors, reducing your LOE is your only option. With Detechtion, you can add authoritative intelligence to the process of reducing costs and increasing production. Contact us and get started on the path today!