

# Flow Assurance Overview

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## What is Flow Assurance

Flow assurance is a relatively new term in the oil and gas industry. It refers to ensuring successful and economical flow of hydrocarbon stream from reservoir to the point of sale. Flow assurance is an engineering analysis process that is used to ensure that hydrocarbon fluids are transmitted economically from the reservoir to the end user over the life of a project in any environment. Production blockages can be caused by a variety of sources, including scale, paraffin, asphaltenes, and hydrates. All of these lead to costly issues like production loss, downtime, equipment repairs, and more.

The global specialty oilfield chemicals market is estimated to be USD 13.65 Billion. To increase the production of oil and improve oil recovery from existing as well as new fields, newer grades of specialty oilfield chemicals and processes are being developed. Technologies that allow users to tackle carbon at the source are promising because they provide immediate carbon cost savings in addition to cascading benefits throughout the lifecycle of a fuel.

This paper provides an overview of the importance of flow assurance in the oil & gas industry.

## Why is Flow Assurance Important

### Environmental Impact

Increasing demand for energy, along with fluctuations in oil and natural gas prices, require a review of existing production, transportation and storage technologies for oil and gas. New technologies have been introduced for oil and gas well development that enhance production economics and efficiency. These technologies are showing success for drilling and production operations. The importance of flow assurance in the oil and gas industry cannot be overemphasized. New technology adoption will be crucial for achieving Canada's long-term climate action targets. Technologies that allow users to tackle carbon at the source are promising because they provide immediate carbon cost savings in addition to cascading benefits throughout the lifecycle of a fuel.

### Drilling Costs in Canada

Recent boom in the shale oil and gas industry in North America is driving the demand for production chemicals. The factors driving growth in the production chemicals market are increasing production of crude oil, growing drilling activities, and pursuing production from

ageing fields. The market is projected to witness huge growth due to enormous potential offered by these drivers. Many of the oil and gas companies are headquartered in this region which boosts the oil and gas industry of North America and the neighboring Latin American region.

Return of capital to shareholders is a priority for Oil & Gas Operators. They often use a model of Return on capital employed (ROCE) is a financial ratio that can be used in assessing a company's profitability and capital efficiency. In other words, this ratio can help to understand how well a company is generating profits from its capital as it is put to use. It is very important that existing wells and processing infrastructure be operating at full capacity.

## Drilling Cost Examples

- Cardium Play has been one of the largest oil fields in the Western Canada Sedimentary Basin with production history of almost six decades. ... The areas with highest liquid content are Lochend and East Pembina, the highest initial production is typically encountered in Lochend, Willesden Green and Ferrier areas.. The average drill, complete, equip, and tie-in costs of all 19 wells came in at \$3.8 million
- Charlie Lake, one of the leading oil plays in North America capital Charlie Lake Formation is a hydrocarbon bearing formation found predominantly in northeastern British Columbia costs \$2 to \$3.5 million per well, dependent on length
- Montney Formation is a major shale gas and tight oil resource. ... This estimate makes it one of the largest known gas resources in the world and equivalent to 145 years of Canada's 2012 consumption. Gas is produced from the Montney Formation in both British Columbia and Alberta Montney oil well is \$3.52 million to drill

## Flow Assurance Approach

The global specialty oilfield chemicals market is estimated to be USD 13.65 Billion. To increase the production of oil and improve oil recovery from existing as well as new fields, newer grades of specialty oilfield chemicals and processes are being developed. Because of the above factors, production chemicals and EOR are projected to be the fastest-growing application segments in the specialty oilfield chemicals market. Chemical solutions help you proactively mitigate these risks before they become big problems. From greenfield development projects to mature field operations, can help you address flow challenges throughout the production lifecycle to avoid startup delays and well shut-ins and increase the profitability of your producing assets.

Production chemicals are used for enhancing the recovery of hydrocarbons from the well. Various categories of production chemicals include corrosion inhibitors, scale inhibitors, asphaltene inhibitors, biocides, demulsifiers, scavengers, surfactants, and others. These chemicals are added in production to achieve the optimum performance and enhance the effectiveness of the oil recovery.

Production chemicals are used in the oilfield operations mainly to improve production maintenance & transport and eventually the recovery from reserves. Increasing oil production, extraction of oils from technologically challenging hydrocarbon geologies, and necessity of better extraction are boosting interest in the market.

This market is driven by increasing production of crude oil, growing drilling activities, and pursuing development and production from established/ageing Fields. The demand for production chemicals is increasing in enhanced oil recovery application as EOR activities are rising globally to enhance crude oil production from mature or declining reserves.

## Flow Assurance production chemicals Glossary

- *Corrosion inhibitor* is a chemical compound that, when added to a liquid or gas, decreases the corrosion rate of a material, typically a metal or an alloy, that comes into contact with the fluid
- *Scale inhibition* is the process of preventing the formation of scale from blocking or hindering fluid flow through pipelines, valves, and pumps used in oil production and processing.
- *Asphaltene inhibitor* is a chemical used in the oil and gas industry to remove asphaltenes from crude oil. Asphaltenes are the impurities found in crude oil that if not removed can choke refining equipment.
- *Bactericides*, also called biocides, can be used to control sulfate-reducing bacteria, slime-forming bacteria, iron-oxidizing bacteria and bacteria that attacks polymers in fracture and secondary recovery fluids.
- *Demulsification* is the breaking of a crude oil emulsion into oil and water phases.

## Conclusion

Flow assurance refers to ensuring successful and economical flow of hydrocarbon stream from reservoir to the point of sale. Flow assurance is an engineering analysis process that is used to ensure that hydrocarbon fluids are transmitted economically from the reservoir to the end user

over the life of a project in any environment. Production chemicals are used as part of the flow assurance process. Various categories of production chemicals include corrosion inhibitors, scale inhibitors, asphaltene inhibitors, biocides, demulsifiers, scavengers, surfactants, and others.

Flow assurance tackle carbon at the source are promising because they provide immediate carbon cost savings in addition to cascading benefits throughout the lifecycle of a fuel. A flow assurance system helps operators with return of capital models ensuring optimal production of existing wells.