ABOUT HALLIBURTON

Founded in 1919, Halliburton is one of the world’s largest providers of products and services to the energy industry. With more than 80,000 employees, representing 140 nationalities in approximately 80 countries, the company serves the upstream oil and gas industry throughout the lifecycle of the reservoir—from locating hydrocarbons and managing geological data, to drilling and formation evaluation, well construction and completion, and optimizing production through the life of the field. Visit the company’s website at www.halliburton.com.
WELLHEAD TO REFINERY, CHALLENGES ABOUND –
Multi-Chem Can Help You Resolve Them

Multi-Chem, a Halliburton Service, is structured to provide the personnel, chemistries and expertise you need to meet any challenge head on and overcome it. Experienced in all aspects of midstream – including gathering systems, gas processing, transmission piping, product storage, and product transportation. Multi-Chem can respond quickly to help when problems arise.

ASSET INTEGRITY IS ASSURED WHEN YOU COLLABORATE WITH MULTI-CHEM

The Multi-Chem Midstream Group works hand-in-hand with you and in every step of the way in whatever service or solution we’re providing. Our pipeline treating and monitoring programs provide asset specific solutions and reporting that detail every stage in your customized program. We provide:

- A proactive approach to corrosion control and the prevention of pipeline failures;
- Comprehensive data related to issues, mitigation recommendations, and the costs of achieving your objectives;
- A means for all necessary equipment maintenance, system monitoring, and electronic logging;
- Midstream specific technical support for solving any issues encountered; and
- Detailed reports with a chronological journal of every related action we take.
At Multi-Chem, we understand the midstream market from the wellhead to the refinery gates. We are experienced in all aspects of midstream, including gathering systems, gas processing, transmission piping, product storage, and product transportation. Whatever the challenge is, Multi-Chem has the solution.
MULTI-CHEM’S MULTI-STREAM™ PRODUCTS TACKLE THE PROBLEMS YOU’RE MOST LIKELY TO FACE

Our corrosion inhibitors neutralize corrosive substances and coat internal surfaces with protective films in flowlines, transmission lines, and gathering lines, to help ensure that integrity is preserved. In addition to providing a variety of corrosion-prevention products, we can also evaluate fluid properties and field conditions to customize a corrosion-treatment program to fit your specific needs.

Multi-Chem’s biological control technologies control deleterious microorganisms in pipelines and process equipment. Our EPA registered biocides will help mitigate problems such as microbiologically influenced corrosion (MIC), biomass accumulation, and biogenic sulfide production. Our biocides can help decrease potential pipeline equipment failures that can lead to downtime and higher operating costs for both onshore and offshore applications.

When H₂S goes down, safety goes up, and at Multi-Chem the safety of our customers, employees, and communities is our number one priority. That’s why we offer a complete line of water- and oil-soluble H₂S scavengers that can be applied via continuous injection or through batch treatments. Our iron sulfide dissolver, AcroClear®, consistently outperforms conventional chemical solutions and provides highly effective removal of iron sulfide in both oil and gas pipelines. AcroClear iron sulfide dissolver is only handled and applied by trained Multi-Chem employees that have received their certification.

Introducing oxygen in any pipeline system can cause problems such as accelerated corrosion attack, water quality issues, and solids deposition. Our oxygen scavengers reduce oxygen in oilfield pipeline systems and help prevent the attack of corrosion mechanisms that can have significant detrimental effects on asset integrity.

MULTI-CHEM IS GOOD INSURANCE FOR FLOW ASSURANCE

When it comes to making sure everything flows the way it should, Multi-Chem can help you plan, even engineer, the most efficient and comprehensive flow assurance program for your system. We can make recommendations before you go online and provide re-evaluations once you’re up and running, enabling quick and efficient adjustments if needed. You can rest assured that we use the latest industry testing equipment and procedures, as well as bringing in industry leaders in flow assurance engineering, to utilize various third-party programs such as “OLGA”, PVTsim”, and Multiflash” applications.
HANDLING THE CHALLENGE OF HYDRATES

In wet gas pipeline systems, sudden changes in pressure, volume, or temperature can cause water to form clathrate cages around gas molecules called hydrates. Not only do hydrates pose a challenge to production by aggregating and adhering to pipeline surfaces, they can cause line blockages and plugs that can pose a safety risk for your team. Multi-Chem utilizes three unique approaches to help prevent and control hydrates. Each approach can be customized to your unique system challenges:

- **Thermodynamic Inhibitors** shift the hydrate equilibrium curve changing the makeup of the water to make the environment non-conducive for hydrate formation.

- **Kinetic Hydrate Inhibitors (KHI)** keep hydrates from forming for a period of time, known as the hold time. As long as the residence time of the fluids in the pipe is shorter than the hold time, no hydrates will form.

- **Anti-Agglomerate (AA)** inhibitors allow for minimal hydrate formation but keeps them dispersed in the hydrocarbon phase to prevent them from forming plugs. Hydrate crystals are kept in slurry, making it easy for them to be transported out with the remaining fluids.

SOLVING PARAFFIN PROBLEMS

As temperatures decrease, higher carbon chain paraffins can precipitate out of solution, forming deposits on the surfaces of piping and equipment. This can cause problems such as equipment fouling, under-deposit corrosion, pump failures, or blocked valves – all leading up to the possible loss of oil and gas production.

Multi-Chem can help remove deposits formed prior to chemical intervention, or prevent them from forming in the first place, by performing a system specific survey to determine what your fluid characteristics are. Then we provide a customized chemical solution to meet your unique system challenges.
TAKING ACTION AGAINST ASPHALTENE DEPOSITS

In pipeline operations, changes in pressure and temperature can occur and cause existing asphaltenes to destabilize and precipitate, forming hard black deposits. These solids can rapidly reduce production flow by creating a choke point with a higher pressure differential.

To help eliminate asphaltene deposition in your oil and gas pipeline, Multi-Chem performs a system evaluation and interpretation of fluid data to determine which types of specialty chemicals and applications are best suited for your specific challenge. Our line of asphaltene inhibitors have proven themselves extremely effective in the field by holding colloidal asphaltenes in solution, thereby preventing their agglomeration and precipitation so they won’t form into a deposit.

HYDROSTATIC TESTING SOLUTIONS

Multi-Chem can provide you with industry leading water treatment systems and water filtration equipment designed specifically for hydrostatic test water treatment. Our water treatment programs are able to help mitigate microbiologically influenced corrosion (MIC), remove solids, and assist in the denaturing of product upon discharge.

Our CleanStream® service employs an ultraviolet (UV) light bacteria control process which enables operators to significantly reduce the volume of biocides used to treat for aerobic and anaerobic (sulfate reducing) bacteria. In fact, if pipeline logistics permit the utilization of CleanStream service on-the-fly, biocide addition can be reduced to zero. CleanStream service is often a preferred alternative to chemical biocides because it’s environmentally friendly and operators don’t have to worry about chemicals in the discharge water.

For post-hydrotest treatment, Multi-Chem can provide extensive corrosion inhibition products and services, as well as those for bacterial mitigation.
WHAT DIFFERENTIATES MULTI-CHEM FROM THE REST?

1. THE BEST OF THE BEST PERSONNEL
   Multi-Chem staff are experienced and accredited. They carry NACE accreditation and are NCCER, Veriforce and OQSG certified. They are skilled in environmental excellence and are experienced in treating specific pipeline and gas processing issues. Multi-Chem also offers personnel with regionalized pipeline experience who know pipeline operations inside and out.

2. MULTI-CHEM’S MVP 2.0™ CHEMICAL PROGRAM MANAGEMENT – ENABLES PERFORMANCE MONITORING OF YOUR CHEMICAL TREATMENT PROGRAM 24/7/365
   With Multi-Chem’s MVP 2.0 chemical program management you get a specific data management system that tracks financial data, monitoring data, and chemical inventory. It provides a comprehensive and transparent view of your entire chemical program, including field and lab analysis, failure reports, testing results, and financial information. The MVP 2.0 chemical program management tool is accessible anywhere there is Internet service. It houses in one location all of your financial and analytical/monitoring data, both current and historical. A customized dashboard is tailored to fit your specific needs. Best of all, the MVP 2.0 chemical program management tool gives you 24/7 access to your program details along with system information so you can evaluate chemical treatments and monitor cost performance in near real time.

3. KNOWING THE LAY OF THE LAND, OR WATER, WITH MULTI-CHEM’S GIS MAPPING SERVICES
   We can provide geographic information mapping with aerial photography, DOT line identification and segmentation. You’ll receive High Consequence Area (HCA) identification, as well as input regarding environmentally sensitive areas, such as watersheds. We can provide you with a complete risk analysis based on the elevation profile and other attribute information gathered from the system analysis.
**SYSTEM MODELING**

Multi-Chem employs computerized predictive modeling that includes the industry’s latest testing equipment and experienced personnel to evaluate your specific needs. Our industry leaders provide:

- **Corrosion modeling** by using in-house and third party programs, such as ECE® software, to understand the corrosion risks associated with your equipment;

- **Flow modeling** for oil, gas, or water utilizing various third-party programs such as OLGA®, PVTsim™, and Multiflash™ applications;

- **Risk modeling** tailored to your specific needs and based on the operating conditions that exist for your assets. We also make sure to align risk modeling with your particular KPI’s; and

- **Hydrate modeling and hydrate curve prediction** using state-of-the-art transient and steady-state fluid flow Multiflash™ modeling software to help ensure hydrates don’t hinder optimal flow.

**MULTI-CHEM AUTOMATION – DELIVERS GREATER CONTROL AND BETTER CHEMICAL PROGRAM MANAGEMENT**

Multi-Chem’s Chemical Inventory Management System (CIMS) offers fully customized automation, giving you greater control over all aspects of your chemical program – from monitoring inventories and usage – to remotely regulating chemical injection rates.

CIMS delivers remote access 24/7. Sensors transmit tank level data and line treatment details from the field to a secure server where the information is collected, organized, stored, and displayed. It’s accessible to you via any Internet-connected device.

With CIMS, you can remotely track chemical inventory, program pipeline treatments (batch and continuous), and confirm chemical delivery. You get pre-set alerts that provide notification of abnormally high or low chemical usage so timely action can be taken to keep your treatment program on track.

Multi-Chem’s CIMS can be integrated directly into our MVP 2.0 chemical program management tool. It is simply the best way to:

- Improve chemical program management;

- Reduce operating costs;

- Increase program efficiency; and

- Reduce potential health, safety, and environmental incidents.

**TRAINING COURSES FOR PERSONNEL AND CUSTOMERS**

We offer customer training schools that are designed specifically for individual customer needs. Training of our own employees is pipeline specific and developed and conducted by industry expert personnel.
MULTI-CHEM CAN HELP YOU IDENTIFY AND MASTER YOUR PIPELINE CHALLENGES

COMMISSIONING AND DECOMMISSIONING
In addition to a wide range of cleaners, biocides and inhibitors we have available, we can also provide:

• Pipeline Flooding, Gauging, and Cleaning
• Hydrostatic Testing
• Umbilical Flushing and Testing
• Air, Nitrogen, and Vacuum Drying
• Methanol and Glycol Swabbing
• Dewatering
• Nitrogen Packing

Both wet and dry lay ups are available to inhibit corrosion, mitigate bacteria and deter oxygen related problems.

PIPELINE CLEANING
Multi-Chem can perform a pre-cleaning survey to ensure that your specific needs are met. We can help you select the Pig that’s best suited for your application, as well as recommend and provide the chemical treatments necessary to remove scale deposits and other solids, to keep your system flowing at its optimal level. Our chemical solutions include solvents and dispersants, biocides, and corrosion inhibitors. We will also perform a cleaner efficacy study to document the success of your treatment.

GAS PROCESSING ISSUES
Multi-Chem provides consulting services relating to compressor and plant processes to numerous gas processors throughout North America. Getting advice in advance about filter fouling, FeS corrosion, foaming, and acid gas intrusion can help alleviate any challenges you may face. Our experience with these types of issues can aid in all aspects of monitoring and mitigation when it comes to gas processing.

REGULATORY CHALLENGES
Due to increasing State and Federal regulations, the importance of maintaining compliance is paramount. We offer regulatory interpretation and training to help you maintain compliance while helping ensure system integrity and safety.
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