Methodology

DIAGNOSIS

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We analyze the complete production cycle (reservoir, well and surface facilities), to define if your problem is mechanical or if it can be treated chemically.

EVALUATION

If it is possible to use a chemical solution, we consider the treatment options that apply to your case according to the identified damage.

TREATMENT SELECTION

We choose the best alternative to address your problem, we establish the basis of the projects and the activities that make it up; In addition we gather all the necessary resources for the provision of the service.

EXECUTION

We implement the previously defined work plan with our clients.

MONITORING AND CONTROL

With the help of specialized software, we analyze each phase of the executed project in real time.

At **Apollo**, we offer complete services to improve well productivity through stimulation systems tailored to your exact needs

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Our integral solution seeks to maintain, restore or optimize the flow of fluids, from the producing rock to the well, during the life





Stimulations for oil and gas wells

Complete solutions that are applied throughout its value chain



If the more than 30 years serving the Mexican **VV** energy industry, Apollo has expanded its portfolio of services, bringing together a team of specialists with the aim of developing solutions to the productivity problems in oil and gas wells, whether they are conventional (vertical) or unconventional (horizontal or multilateral).

In order to ensure optimal results and provide you with a comprehensive service, Apollo performs simulations prior to stimulating the well. considering current reservoir conditions. Later, during the execution of the project, constant monitoring of the behavior of the operating parameters is carried out in order, if necessary, to make the pertinent adjustments. Finally, a comparison is made between the past and the post intervention production levels, and based on the results we issue our conclusions and recommendations.



We use specific action chemicals for the development of each stimulation system:



EFFECT ON THE RESERVOIR

- They react slowly at high temperatures with carbonates and steel
- Strong acid that provides the largest volume of dissolved calcareous rock
 - Dissolves clay, feldspars and sand minerals
- Gelling polymer of HCl and water, effective at temperatures above 149 ° C
- Prevents sludge formation and works as an asphaltene solvent for acids
- Prevents the precipitation of spent acidic liquids and iron, ferric and ferrous ions
- Unique blend of select solvents; breaks emulsions and leaves the formation wet with water
 - Prevents aqueous emulsions from forming in crude oil
 - Formulation designed to treat problematic asphalt deposits
 - Surface active chemical that prevents and controls paraffin deposition
 - Encapsulates clays to inhibit hydration and dispersion
 - For acidification in gas or oil wells, retards the acid reaction on the pipe
- Helps to remove the oil layer, thus preparing the reaction between the rock and the acid
 - It reduces the surface tension, as it is positioned at the interfaces
 - Dissolve organic sediments

The operating strategy is applicable from two systems, depending on the type of fluid to be pumped:

ACID SYSTEMS

They allow us to maintain and increase the productivity of the wells, either by dissolution or by engraving the rock, without damaging the producing area.

- Preventive acid system for complex damage: composed of a mixture of solvents and organic acids that dissolve the deposits present in the production line, which prevents the hydrochloric acid (HCI) from reacting with them before coming into contact with the formation, thus avoiding the creation of asphalt mud.
- Acid system with HCI: based on controlled hydrochloric acid, it dissolves the rock creating new communication channels through the damaged area. The set of selected additives prevents the precipitation of the iron, the formation of emulsions and asphalt sludge; this application promotes a better recovery of the reaction fluids and fines, present in the solution.

 Acidic system with gelled HCI: provides a longer reaction time, thereby achieving greater penetration of the treatment. It is based on the use of the gelling agent to reduce the loss of the fluid and delay the reaction of the acid in the formation.

NON-ACID SYSTEMS

These are jobs that, through non-reactive treatments, allow us to maintain and increase well productivity, thanks to the dispersion of organic materials or drilling fluids.

 Organic system: it is made up of a group of surfactant additives that includes cosolvents, solvents, asphaltene dispersants and paraffins, integrated in an organic solvent fluid. Very useful to break emulsions, water blockages and to remove organic deposits; keeps paraffins and asphaltenes in solution and leaves the formation wet with water.