

# Integrated Services Cut Completion Time by 40%

Case study: Field studies guide PEMEX Burgos basin natural gas drilling project

## Challenge

PEMEX wanted to enhance operating resources and capabilities by using Schlumberger Integrated Project Management (IPM) to increase gas production from the Burgos basin of northern Mexico.

## Solution

IPM provided rig provision and management; well drilling; directional drilling; drilling fluids; cementing; logging; completion and stimulation; production enhancement and logistics; and civil works.

## Results

Schlumberger delivered 375 wells over 5 contracts. Well completion times were reduced by 40%. Wells were efficiently stimulated using the PowerSTIM\* well optimization service, increasing productivity by 5% to 10% per well. New drilling opportunities were identified and a better understanding of reservoir structure and stratigraphy was developed.

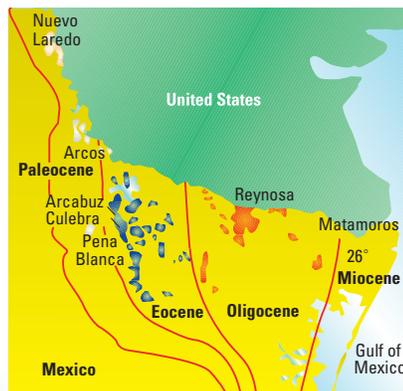
## Increasing gas production

In January 1994, a PEMEX task force developed a new approach for significantly increasing gas production from the Burgos basin of northern Mexico. PEMEX wanted to enhance operating resources and capabilities by using integrated service companies to meet the high demand for natural gas in industry and power generation in Mexico.

PEMEX contracted with the IPM team in 1997 on the first integrated project. The project plan called for the IPM team to acquire 3D seismic data on 250 mi<sup>2</sup>, perform 2 integrated reservoir studies, drill 31 wells, and construct a gas-gathering station and 4 gas compression plants. The IPM team completed the work in 11 months.

## Integrating services and full project management

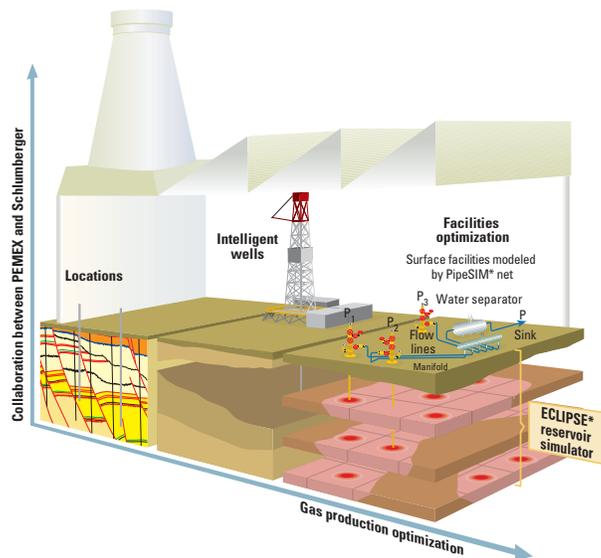
The relationship and trust between PEMEX and IPM have grown since that first project, as has the scope of IPM responsibilities: from providing integrated services to full project management—planning through implementation. IPM is currently undertaking the fifth major integrated project contract in the Burgos basin.



*Geographic location of the Burgos basin.*

In the latest contract, IPM will provide all engineering, project management and related services to bring 310 wells on line. IPM responsibilities will include designing the drilling programs; providing and managing rigs; and supervising and performing completion, perforating, fracturing, and well-testing operations. In addition, the IPM team will develop all engineering plans for production enhancement, and manage and execute wellsite supervision, directional drilling, data collection, drilling fluids selection, and flowline installation. The IPM team will also supervise and

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IPM provides engineering, project management, and related services to bring wells on line and develops engineering plans for production enhancement. In a newly fractured interval. This stimulation treatment resulted in a gas production rate of 110,000 m<sup>3</sup>/d [4 MMcf/d] versus the originally expected production rate of 40,000 m<sup>3</sup>/d [1.5 MMcf/d]. Applying expertly designed production optimization solutions in the Burgos basin has resulted in highly successful completions and significantly increased the long-term producibility of these wells.

## Generating new prospects

PEMEX personnel and a multidisciplinary team of geologists, geophysicists, and engineers from Schlumberger Data & Consulting Services (DCS) conducted six integrated field studies in the Burgos Central area. The data from these studies identified new drilling opportunities and provided a better understanding of reservoir compartmentalization.

The data also contributed to a new understanding of the complexity of the reservoir. As a result, the project team decided to acquire new seismic data before continuing with ongoing reservoir studies. With the new seismic data, the team renewed their reservoir studies by integrating seven 3D seismic data cubes into one megacube. The goal of the new reservoir evaluation was to generate 50 new prospects within the study area. Integrating the megacube and associated well data resulted in a new and more accurate 3D fault model for the Burgos central area that generated 67 new drilling prospects, easily surpassing the original project goal. The exploratory and step-out wells recommended from the study significantly increased field reserves.

manage all logistics, waste management, and construction of access ways and wellsites.

From January 2003 to January 2004, IPM completed 72 wells, performed 93 fracture jobs, and tested 122 intervals with a collective initial production rate of 5.35 million m<sup>3</sup>/d [189 MMcf/d].

## Maximizing production from tight sandstones

The success of Schlumberger PowerSTIM service in optimizing gas production has been one of the project highlights. This integrated optimization service has identified producible sandstone zones with permeability as low as 0.05 mD.

In one well, a ClearFRAC\* polymer-free fracturing fluid was used

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[www.slb.com/ipm](http://www.slb.com/ipm)