



mySAP™ SRM AT PEMEX GAS

Enhancing Economic Value by Building a Community with Suppliers

Pemex Gas is the exclusive provider of natural gas to consumers and businesses in Mexico, but the government will soon open the market to other companies. To better position itself to face competition, Pemex Gas is improving its performance through better procurement processes. The company is using mySAP™ Supplier Relationship Management to enable these processes, and is seeing shorter cycle times, lower inventory, and other measurable benefits.

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ABSTRACT

AT A GLANCE

Strategic Goals:

- Establish lower cost structure to position the company for opening of the natural gas market
- Enhance procurement processes to reduce cycle times, support cost reduction, and develop partnerships with suppliers
- Improve economic value added

Approach:

Pemex Gas focused on improving strategic sourcing and operational procurement processes for acquisition of high-value direct and indirect materials and services. The company developed an electronic catalog of approved items and services, and gradually enabled key suppliers to conduct business through an online portal. Pemex Gas established processes facilitating transmission of orders, and enabled electronic processes to support public and restricted invitation bidding by suppliers. This approach was enabled by mySAP™ Supplier Relationship Management and mySAP ERP.

Results achieved from the third quarter of 2003 through the second quarter of 2004, which will contribute to improved economic value added, include:

- **Reduced prices on one-year contracts** by 6% on average
- **Lowered cycle times** covering release order decision to order placement by 72%
- **Reduced release order placement process costs** by 20%, and improved productivity by eliminating 64% of activities and automating 60% of manual processes
- **Lowered bidding process costs** by 13% through electronic collaboration
- **Reduced inventory** of purchased items by 25% and maintenance inventory cost by 9%
- **Contributed to benefits for suppliers**, such as a 70% reduction in cycle time for the sales process and a 50% reduction in manpower necessary to develop products

Pemex Gas, a division of the state-owned company that manages Mexico's vast hydrocarbon resources, processes and markets natural gas and liquids from gas. By law, the company has been the exclusive provider of natural gas to Mexican industries and consumers, but the government has been trying since 1995 to open this market to competition. In response, Pemex Gas has undertaken an initiative to improve customer service and reduce its cost structure to more effectively compete in the new environment. In particular, the company is taking actions to improve the effectiveness of its procurement processes to enhance the true economic profit (economic value added) attained. Pemex Gas progressively established electronic relationships with suppliers and streamlined processes for determining sources of supply and fulfilling purchasing requirements. The company deployed mySAP™ Supplier Relationship Management (mySAP SRM) and mySAP ERP to enable new processes, succeeding in shortening cycle times, lowering inventory levels, and reducing prices for materials and services purchased.

BUSINESS

Pemex Gas and Basic Petrochemicals (“Pemex Gas”), a division of Mexico’s state-owned oil company known as Petróleos Mexicanos (“Pemex”), is the world’s ninth-largest processor of natural gas and liquids from gas. With close to US\$16 billion in sales in 2004, Pemex Gas would on its own be Mexico’s fourth-largest company.

Pemex Gas is responsible for the processing, transportation, marketing, and storage of natural gas and natural gas liquids. In particular, the company produces and sells liquefied petroleum gas (LPG), naphtha, ethane, and sulfur, which are by-products of natural gas and petroleum production. In 2004, the company’s production averaged 3.2 billion cubic feet of dry natural gas per

day, while gas liquids production averaged 452,000 barrels. The company has 12 processing plants in Mexico, and over 9,000 kilometers of natural gas transmission lines, 1,800 kilometers of LPG pipelines, and 1,500 kilometers of petrochemical pipelines (see figure 1).

Origins

In 1938, Petróleos Mexicanos instantly became the backbone of Mexico’s economy when President Lázaro Cárdenas nationalized the 17 oil companies operating in Mexico, a celebrated event whose anniversary is still a national holiday. Cárdenas amended the constitution to bar any entity but the state from exploring, producing, and marketing petroleum products.



Figure 1: Pemex Gas: Network of Pipelines and Processing Plants

Until the mid-1970s, Pemex focused on domestic needs. The company began participating in international energy markets in the late 1970s, but faced financial challenges in the 1980s due to the volatility of global energy prices. This experience motivated the company to improve management controls such as internal transfer prices to encourage responsiveness to external economic conditions, and to establish benchmarks to track efficiency.

Pemex Gas was created in the early 1990s, when Pemex was divided into four separate business units to better manage operations, track costs, and monitor revenue. The largest division is Pemex Exploration and Production, which locates and develops crude reserves. Pemex Refining distills petroleum to derive more valuable products such as gasoline, and Pemex Petrochemicals produces, distributes, and markets products and feedstocks for Mexico's chemical industry.

Modern Era

Today, Pemex is one of the world's largest oil producers. With 2003 revenues of nearly US\$56 billion, the company employs 140,000 people, 12,000 of whom work for Pemex Gas. The ubiquitous Pemex gas stations display the Aztec eagle and the red, white, and green of the Mexican flag on street corners throughout the country. The company plays an essential role in supporting public finances and shaping the economic development of Mexico.

Pemex is pursuing a program of modernization to better serve customers, contribute to national development, and safeguard the environment. Specific objectives include increasing the supply of crude oil and natural gas to meet growing demand, improving production capacity, reducing the environmental impact of its refining and processing systems, implementing a total quality system, and creating new business lines that will contribute to long-term growth.

Turning Point for Pemex Gas

Despite Mexico's substantial natural resources, the country still imports 25% of the natural gas it consumes domestically. Since the early 1990s, demand has been growing at 7% per year as state-owned electricity plants switch to cleaner fuels, residential and

“Our objective now is to maximize economic value added.”

Roberto Ramirez, Vice President of Planning, Pemex Gas

business customers' appetite for electricity increases, and Mexican industries – including Pemex itself – grow and require more energy. Boosting production would help to meet the increasing need for natural gas; but it became clear that this action alone would not be sufficient to satisfy the growing requirements for low cost and better service. By the mid-1990s, pressure was building on the government to take additional steps.

“The turning point for Pemex Gas came in 1995,” says Roberto Ramirez, vice president of planning for Pemex Gas. “That's when the Mexican government decided to open the natural gas market, which should ultimately result in investment, competition, and better service for consumers. We had a monopoly. We could sell our products without much marketing, and we had taken our customers for granted. Suddenly, we faced the threat of competition, and we knew we would lose market power.”

CHALLENGES AND OBJECTIVES

Management began to focus on overall business performance, and process improvements were enabled in 1998 through an implementation of SAP® software. Moreover, “We realized that once the government deregulated the gas market, customer

“All suppliers are important to us.”

Claudio Trulin,
Vice President of Finance and Administration, Pemex Gas

service would have to become one of our competitive advantages,” says Vicente Cordova, chief information officer. “And we needed to improve our customer relationships long before the onslaught of competition – so as to lose as few customers as possible, and focus on the most profitable ones.”

Pemex Gas undertook initiatives to better understand and serve its customer base, including establishing new customer-facing processes enabled by an implementation of mySAP™ Customer Relationship Management (mySAP CRM) in 2001. Nonetheless, improving customer-facing processes was only one component in its efforts to address looming competition.

Economic Value Added

In 2002, the company decided to establish an overarching framework to evaluate its activities and set priorities, adopting the approach known as economic value added. Economic value added is a method for evaluating decisions based on the ability of a chosen course of action to generate a “true profit,” defined as the after-tax profit minus a charge for the cost of capital. Real value is realized when net income exceeds the opportunity cost of invested capital.

Economic value added is a measure of performance, but it can also form the foundation for a complete financial management and incentive system guiding all management decisions. Using economic value added to measure performance could ensure that the company was creating wealth and better positioning

itself for the changes to come. “Our objective now is to maximize economic value added,” says Ramírez. “Every single project, and every investment, has to generate economic value added – or we won’t allow it to proceed.”

Importance of Procurement

Pemex Gas has an overarching goal to become a world-class enterprise, acknowledged for its responsible use of public resources, leadership in product quality and value-added services, and profound respect for the environment. To achieve this goal, the company needed to find ways to more efficiently manage the resources used throughout its value chain – and in particular, its considerable use of inbound goods and services.

That is, Pemex Gas recognized opportunities to enhance procurement processes. These processes could be more cost-effective (thus contributing to improved economic value added), and oriented toward adding value for customers, providing data for strategic decision making, and established within a framework of greater transparency and control.

The company faced the following specific challenges:

- Limited visibility into demand
- Strategic sourcing inefficiencies
- Operational procurement inefficiencies
- Excessive inventory to support plant operations
- Ineffective access to information about operations
- Inefficiencies in the supplier community

Each of these challenges is discussed below.

Limited visibility into demand. Demand for procured items and services existed in production areas, administrative departments, and elsewhere within Pemex Gas. There was some aggregation of repetitive requirements in specific areas, but no overall aggregated view of demand. With only a very limited ability to

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Claudia Peralta,
Purchasing Manager and Project Manager, Pemex Gas

forecast its complete set of requirements, and no consolidated material-requirements planning process, the company lacked a good bargaining position with suppliers. For example, Pemex Gas purchased the same tires for vehicles around the country, but had no overall view of immediate and future needs.

Also, procurement staff often had outdated information about purchases or prices. Purchasers were often unsure of the correct price, and sometimes used the average price paid.

Strategic sourcing inefficiencies. Strategic sourcing covers the processes of analyzing spending, developing supply strategies, and negotiating terms and conditions of contracts with selected suppliers.

Mexican law governing procurement processes stipulates that all contracts with suppliers must be assigned through public bids, with a few exceptions such as procurement of a specific branded or patented item (for example, a machine part), a requirement with value below US\$30,000, or an emergency requirement.

Through requests for quotations (RFQs), Pemex Gas outlines requirements for qualified suppliers to submit proposals to provide materials or services. The supplier’s proposal is final and binding, and the supplier has no opportunity to lower its bid. Pemex Gas is generally obligated to accept the lowest bid as long as the supplier can meet specifications. The company cannot reduce the time periods for establishing a contract with a supplier after having determined a procurement requirement, because these time periods are mandated by law. As a public sector company, Pemex Gas is not permitted by Mexican law to establish auctions, although auctions might allow reduced contract prices.

At Pemex Gas, about 100 people are involved in strategic sourcing activities. Key characteristics for the three main types of strategic sourcing are as follows:

- Public bid (national or international)
This is mandated for contracts exceeding US\$210,000, with limited exceptions, including an emergency, or satisfaction of the criteria for a direct assignment (see below). The cycle time, which includes preparing and verifying a purchase requisition, the bid, and assigning the contract to a supplier, varies based on the type of contract established. The total minimum cycle time ranges from 95 to 125 days.
- Restricted invitation (to at least three bidders)
This is mandatory for contracts with a value between US\$30,000 and US\$210,000, with limited exceptions (the same as for a public bid). The minimum time from inception to contract ranges from 55 to 85 days.
- Direct assignment
This is a process for procuring a specific item, such as a patented or branded product, or for an item with a value under US\$30,000. Bidding may be part of this process – for example, bids may be submitted by different suppliers. The minimum time from inception to contract ranges from 40 to 75 days.

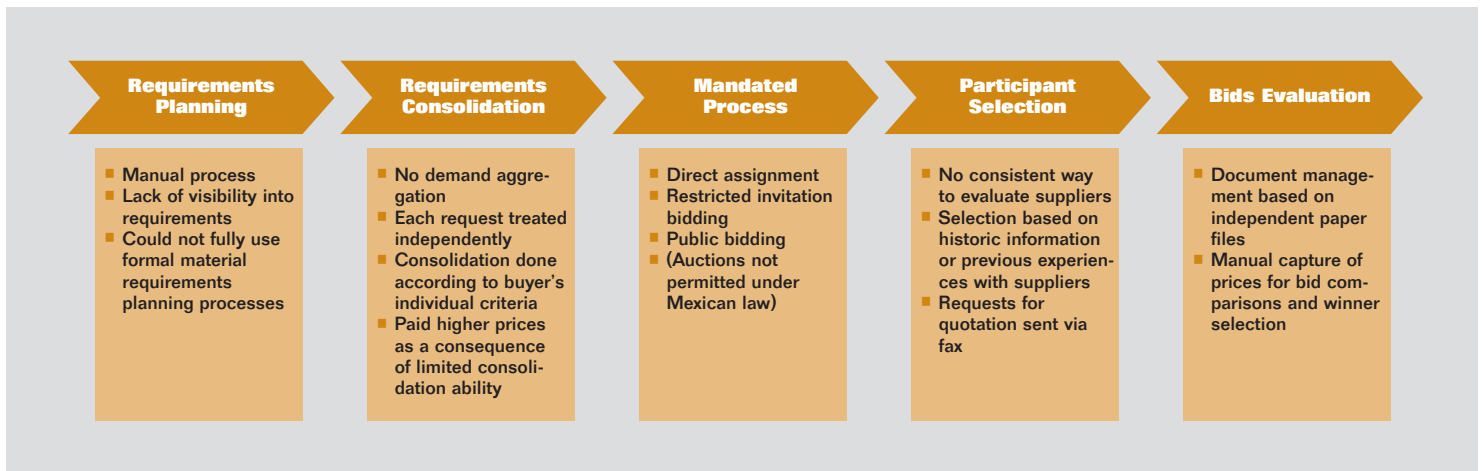


Figure 2: Strategic Sourcing – Process and Challenges

The company's existing strategic procurement process was inefficient (see figure 2), requiring considerable manual processes, paperwork, and hierarchical approvals. Pemex Gas lacked the ability to consolidate requirements automatically or fully use a formal material requirements planning process, and information about procured items, possible suppliers, and prices was limited.

Buyers did have some discretion about supplier selection, even with the lowest-bid restriction. However, without quantified information, buyers would select suppliers based on personal experience, rather than performance data. And when quantified information was available, the buyers would use data from the existing SAP system, but still had to resort to time-consuming manual processes to support decision making.

Operational procurement inefficiencies. Operational procurement covers the processes of ordering, receiving, and paying for purchases; tracking expenses; and ensuring compliance by company staff and by suppliers.

Once contracts were signed, Pemex Gas executed operational procurement processes to purchase material and services. These procurement processes might be executed for an open contract with multiple releases, or for a single purchase.

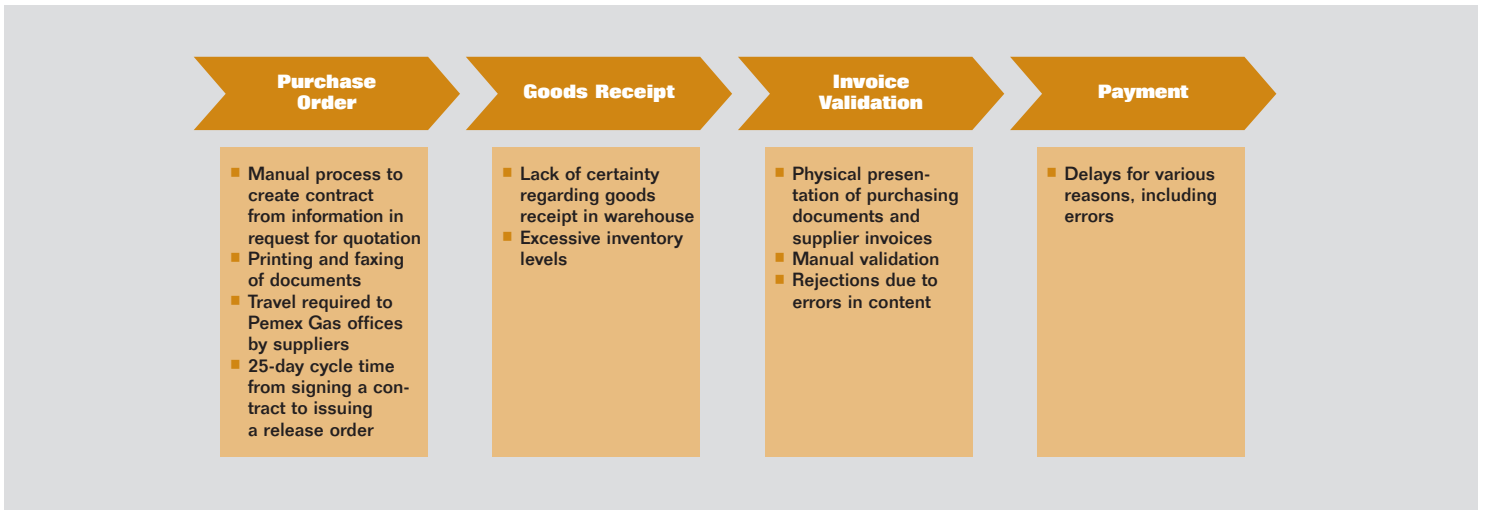


Figure 3: Operational Procurement – Process and Challenges

Operational procurement processes were inefficient for reasons similar to those of strategic sourcing (see figure 3). Employees had limited access to information – about contracts, suppliers, budgets, and agreed prices. Also, a significant amount of manual

“We’re getting an immediate payback through better efficiency. And purchasers can spend more time on strategic sourcing.”

Claudia Peralta,
Purchasing Manager and Project Manager, Pemex Gas

processes and paperwork was involved in proposals, funding, approvals, and so forth – even though some SAP capabilities had already been implemented. Internal staff often had trouble getting attention from the overburdened purchasing department.

A significant source of inefficiency was the use of strategic sourcing when operational procurement processes would be sufficient. For example, some routine purchases of preselected items required technical and economic justifications to be prepared in advance of a purchase. In such cases, a simple release order against an established contract would have been appropriate and more efficient.

Excessive inventory to support plant operations. About 30% of all procurement within Pemex supports production and distribution operations. Pemex Gas stores direct materials such as chemicals at its plants, along with plant maintenance items including pipes, bulbs, and fasteners. There are 11 gas processing plants, 5 pumping plants, and 29 LPG and natural gas terminals located around the country, with people at each site in charge of handling operational procurement. Strategic sourcing was handled by staff in the north, central, and south regions of Mexico, who would determine requirements and establish contracts based on annual operating plans.

However, without a careful data-based analysis of operations, individual facilities regularly maintained higher-than-necessary levels of buffer inventory. Although each plant had back-up facilities, there was significant concern that a shortage of critical

“Price reduction is one of the biggest benefits we’ve obtained.”

Jorge Moreno,
Assistant Manager of the Pipeline Business, Pemex Gas

inventory might cause a shutdown. When an operation was halted, there was an impact on Pemex Gas’s revenue and a disruption of gas supply to the national market.

Facilities also maintained high inventory levels because of long lead times and high transportation costs – weeks or months to procure materials, limited ability to track items en route, and occasional uncertainty over whether the warehouse actually had received items ordered. “It was difficult to obtain materials required urgently,” says Mario Othoniel, a member of the procurement planning group in the production business line. To ensure continual operations, equipment and materials were often sent from one plant to another, adding unnecessary transportation costs.

Ineffective access to information about operations. As a government-owned company, Pemex Gas must make public information about its management. With information sometimes difficult to find in paper files, Pemex Gas could not easily provide details about operations, contract bidding, or cost structure to the authorities.

Inefficiencies in the supplier community. For smooth operations, Pemex Gas relies on suppliers of goods and services both large and small. These suppliers, who had borne the burden of paperwork to qualify as suppliers and then again to make the sale, were forced to work overtime because of internal inefficiencies at Pemex Gas. Numerous small and similar orders each required a response, for example. Invoicing discrepancies resulted in payment delays. Consequently, suppliers charged prices to reflect the extra work and carrying costs – and sometimes communicated that their relationships with Pemex Gas were not as constructive as they would have liked.

Pemex Gas management wanted to establish a supplier ecosystem and constructively engage its supplier community. “All suppliers are important to us,” says Claudio Trulin, vice president of finance and administration. “We wanted to establish a mechanism to treat suppliers equally, consistent with Mexican law, and according to their importance to our operations. We wanted to form partnerships that would encourage favorable pricing, procurement efficiency, and on-time delivery.”

Above all, Pemex Gas knew that by smoothing out procurement – and by building a supplier community to collaborate more effectively – the company could significantly reduce the cost of delivering natural gas to businesses and homes. Such collaboration would reduce procurement cycle times, address the company’s goal of improving economic value added, and position it to compete when the market opened.

IMPLEMENTATION

The decision to improve procurement processes paralleled the adoption of economic value added as a key business measure.

“To maximize economic value added, we have to support a triangle of people, strategy, and execution,” says Ramírez.

“We were investing a lot to train our people, and we developed and communicated clear strategies. But execution is essential, because none of this makes any difference unless you can implement your strategies.”

Selection of mySAP Supplier Relationship Management

The 1998 SAP implementation had provided a good foundation to support execution. In fact, Pemex Gas had taken a significant step forward (and gained attention from others in the Pemex Group) when it was able to reduce monthly financial closing from 45 to 15 days. In addition to financial and customer relationship management, SAP software supported sales and distribution, human resources, materials management, and other processes.

Despite the company’s positive experience with SAP, the company acknowledged in 2002 that there were many gaps, especially in procurement. “We decided that improving procurement was key to improving economic value added and to building a foundation for all of our future e-business developments,” says Ramírez. “We analyzed our options very carefully – we don’t make these decisions lightly – and decided that executing our new strategies could only happen through further implementation of SAP software, because it’s an enabler of integrated processes.”

mySAP SRM in particular offered specific capabilities of value to Pemex Gas. “We chose mySAP SRM because it’s oriented to direct and indirect material procurement, and we could manage content by using integrated electronic catalogs,” says Claudia Peralta, purchasing manager and project manager for the mySAP SRM implementation.

The first two phases of the implementation, which largely adhered to the ASAP methodology, proceeded as follows.

Phase 1: Operational Procurement and Supplier Collaboration

In this phase, implemented from November 2002 to June 2003, Pemex Gas established two scenarios for direct and indirect goods procurement, with the purchaser selecting products from an electronic catalog (see figure 4):

- Release orders (scenario 1)
Transmit and formalize release orders originating from an open contract established through a bidding process, or through direct assignment
- Purchase orders (scenario 2)
Transmit and formalize purchase orders originating from a direct assignment

Pemex Gas, as a selected ramp-up customer for mySAP SRM (version 2.0), was able to implement the following capabilities (see figure 5).

- Primary operational procurement process
SAP Enterprise Buyer (SAP EB), the core e-procurement component of mySAP SRM, allows end-user creation of shopping carts. The phase 1 implementation relied strongly on the mySAP ERP back-end system, where documents such as purchase orders, goods receipts, and invoices reside, and where financial checks and postings are processed. The implementation employed the workflow that Pemex Gas had already developed in SAP software for purchasing and invoicing.
- Catalog management
Electronic catalogs allow Pemex Gas to create a database of approved suppliers and products. Pemex Gas implemented solutions from Requisite Technology, which is a provider of enterprise electronic catalog solutions that tightly integrate with SAP solutions. Requisite provides a robust search engine, allowing users to do a search on specific suppliers or product categories, compare products, and view photographs of items.

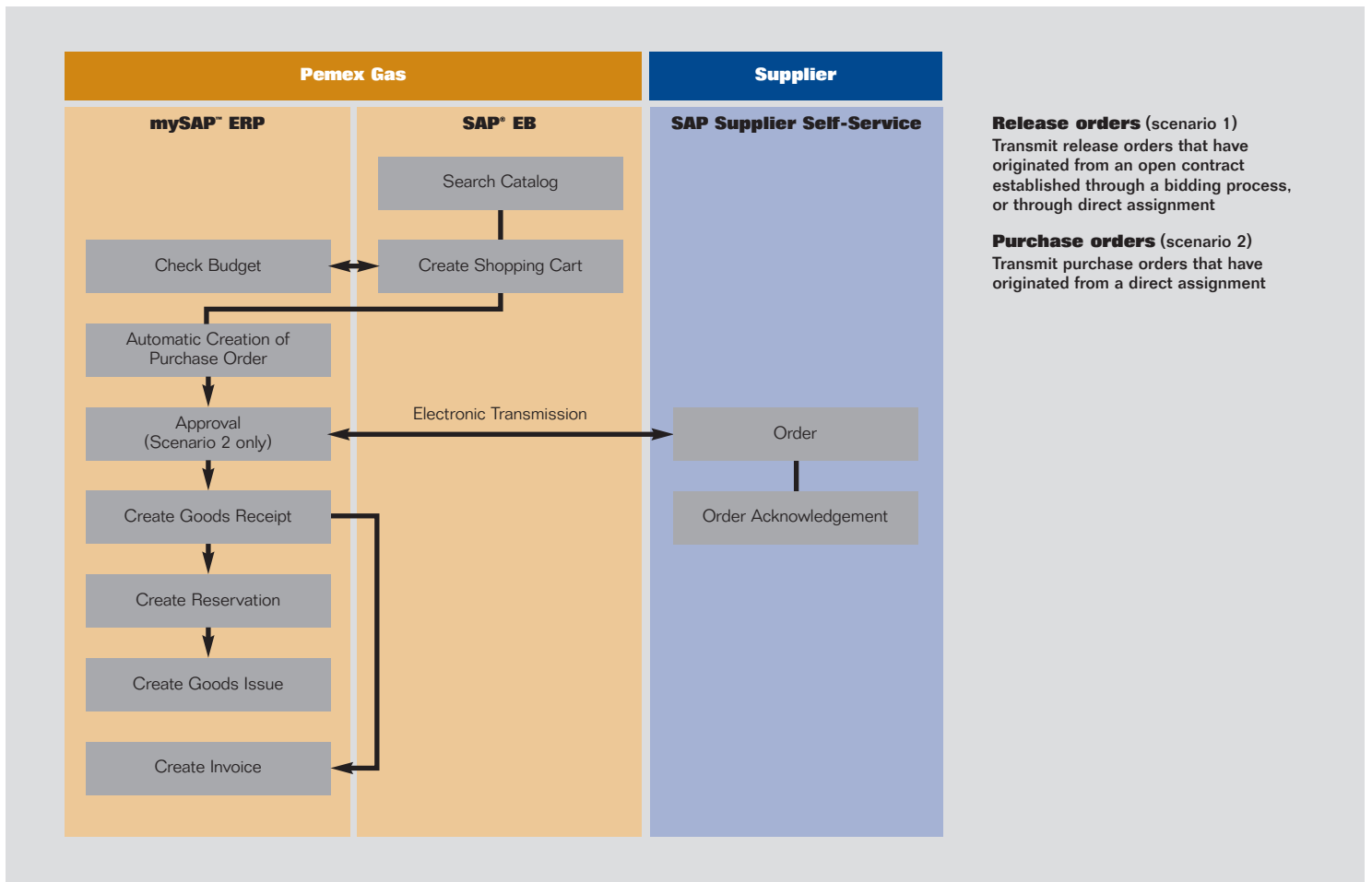


Figure 4: Process for Scenarios 1 and 2

■ Supplier self-service procurement

Pemex Gas created a supplier portal using SAP Enterprise Portal (SAP EP) and the SAP Supplier Self-Service component of mySAP SRM, which enables collaboration between buyers and their suppliers. SAP Supplier Self-Service is integrated with e-mail and the back-end mySAP ERP workflow, and allows vendors to receive and confirm purchase orders electronically. During the first phase, 15 suppliers were established, including Praxair, Rohm and Haas, and Holland Chemical.

■ Design and order collaboration

The collaboration capability of SAP EP facilitates design and order collaboration within Pemex Gas and with its suppliers. This capability helps people manage design-related documents (such as specifications and patents) and order-related documents (such as contract conditions and official letters) that are under development. This collaboration capability includes functions for tracking individuals who access documents, establishing security and access restrictions, and managing scanned documents containing signatures.

In phase 1, Pemex Gas implemented the SAP Exchange Infrastructure (SAP XI) component, which enables data exchange between mySAP ERP and SAP Supplier Self-Service¹ using Extensible Markup Language (XML).

Eight SAP consultants and about 25 staff members from Pemex Gas were assigned to the phase 1 program. Key elements of the implementation were as follows.

High-value items. Although many companies choose to reduce risk by starting out with low-value items such as office supplies, Pemex Gas sought a faster return on its mySAP SRM investment by starting with high-value items, including materials directly used in plant operations.

Process focus. SAP Consulting² worked with Pemex Gas to manage the implementation. The primary focus was on redesigning processes in areas of lower complexity. “We didn’t implement the current process with new technology,” says Arie Polichuk, solution engineer, SAP Consulting. “We made a deep process review and suggested some changes. We conducted several interviews to understand the Pemex Gas procurement processes and find out where the non-value-added areas were. For example, there are many steps in the Pemex Gas approval process. We suggested that they remove several steps, which would allow them to speed up and simplify approvals while still adhering to Mexican acquisition law.”

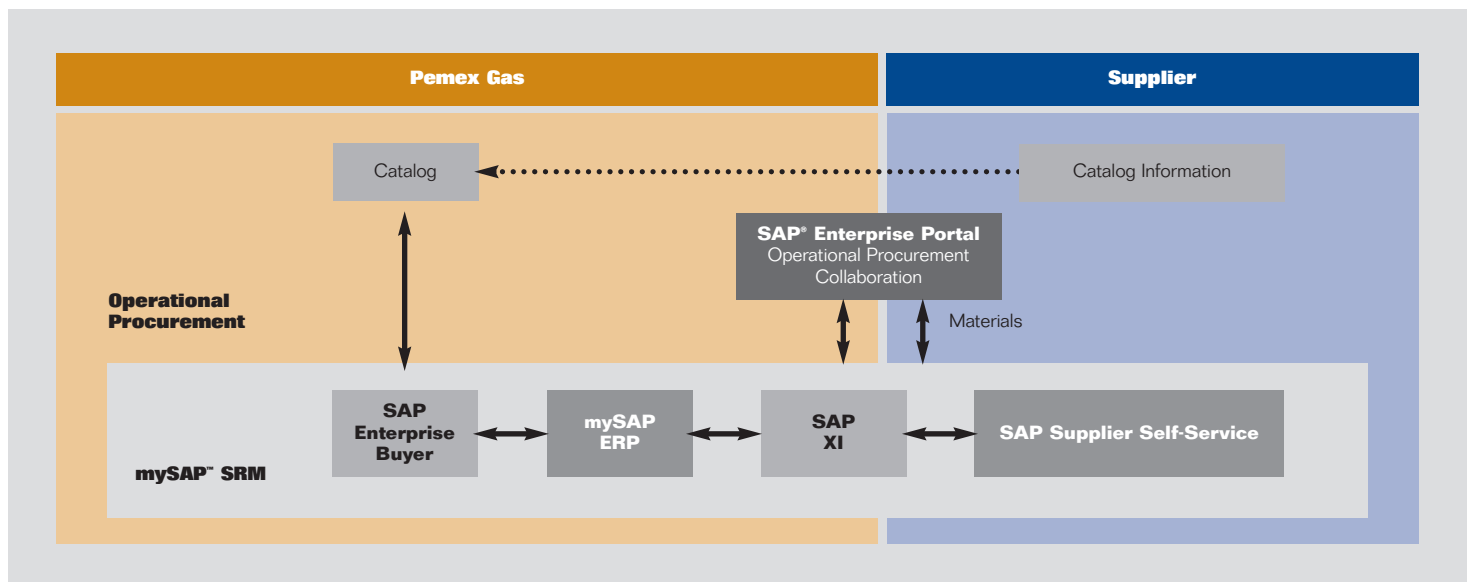


Figure 5: Phase 1 – Operational Procurement and Supplier Collaboration

¹SAP XI enables data exchange between SAP EB and SAP Supplier Self-Service for services procurement described for the phase 2 implementation.

²SAP Consulting is an organization within SAP Customer Services Network that provides a single point of access to the most comprehensive SAP solution services, including consulting, custom development, education, support, and hosting.

Supplier community development. The implementation of SAP Supplier Self-Service in phase 1 was key to transforming the relationship between Pemex Gas and its suppliers. Before this implementation, suppliers reportedly believed that the company's single priority was low prices, and that selling to Pemex would involve substantial paperwork requirements and very large administrative expenses. As SAP Supplier Self-Service was being implemented, Pemex Gas selected a few suppliers in a pilot to conduct business electronically. Feedback from those suppliers singled out for specialized training and new commercial agreements was that they now felt like an important part of the supplier community – exactly the sense of cooperation that Pemex Gas intended for all key suppliers.

Catalog use. Materials appear in a catalog only when they are listed in a contract. Vendors are responsible for maintaining their own catalog content and submitting updated spreadsheets to Pemex Gas for approval.

Establishing the catalogs was crucial to streamlining the procurement processes and reducing errors. “The catalogs provide visibility into planned purchases and supplier prices, and tailored procedures for staff with different roles,” says Sergio Nava, procurement process team lead. “Also, the catalogs are very tightly integrated with mySAP ERP and mySAP SRM. The products in the catalogs are linked to contracts in mySAP ERP, and the catalogs communicate with mySAP SRM via an open catalog interface. Thanks to this integration, one can find the contract associated with a product in a catalog. Also, purchase order releases in mySAP ERP can be created by searching the catalog for a product and using mySAP SRM to execute the release.”

Use of the catalogs also supported efforts by Pemex Gas to standardize product master data. The company started using the United Nations/Standard Products and Services Code (UN/SPSC)

“But more important, consolidating specifications was a strategic imperative for us. We now have fewer different specifications to produce . . .”

Carlos Gonzalez, General Manager, Sichelub

material classification schema, which provides a standard against which all vendors' products can be classified. “Use of the UN/SPSC schema allowed Pemex Gas to think about their product data structure in a new way,” says Polichuk. “They were able to clean up their product master records by putting in place processes to recognize duplicates and eliminate unused records.”

Suppliers summit. Phase 1 capabilities were ready in June 2003, in time for Pemex Gas to publicize its success at a July 2003 “Suppliers Summit” event to which all division directors of Pemex, as well as the press, were invited. The event included video demonstrations of how suppliers could electronically receive purchase orders and confirm with Pemex Gas – an important breakthrough in e-business development in Mexico. The event generated favorable reports in numerous newspapers and magazines.

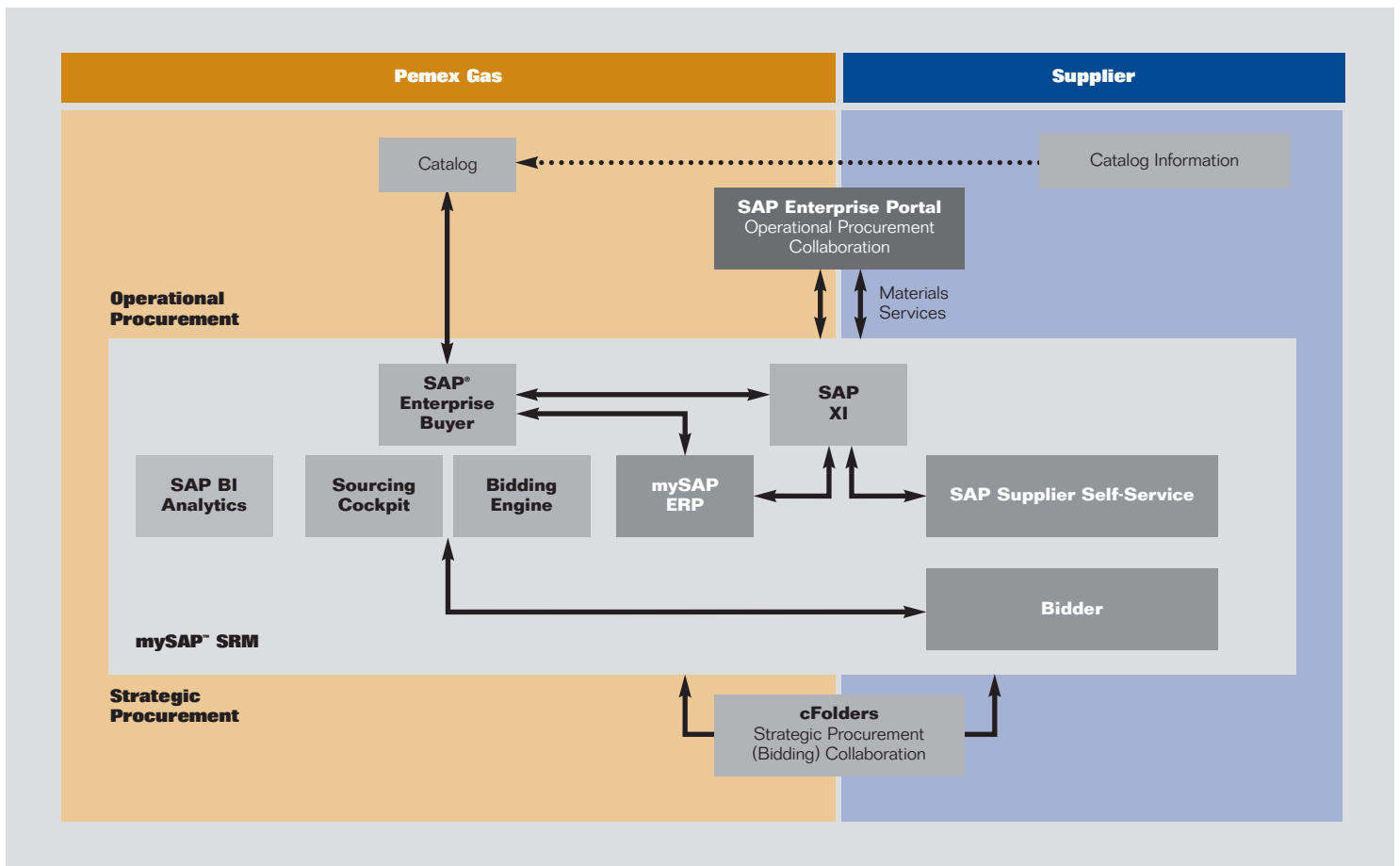


Figure 6: Phase 2 – Strategic Sourcing and Services Procurement

Phase 2: Strategic Sourcing and Services Procurement

This phase, implemented from August 2003 to June 2004, was part of an overarching initiative called “Transformation and Innovation of the Value Chain” (TIVC; see insert). Supporting this phase were 25 Pemex Gas staff members, 8 consultants familiar with mySAP SRM, and several more SAP consultants involved on a part-time basis. Pemex Gas upgraded the capabilities from phase 1 to mySAP SRM (version 3.0) and implemented the following (see figure 6).

Bidding process for RFQs (scenario 3). Pemex Gas implemented the mySAP SRM bidding engine capability to enable the company to electronically issue RFQs and receive bids according to the Mexican law for strategic sourcing of material and services. That is, the company established electronic processes to support public bids, restricted invitation bids, and direct assignments³. The new contracts are typically established for one year.

³ Although Pemex Gas must accept non-electronic responses to public bids, it can require that restricted invitation bids be limited to an electronic RFQ and response process (a similar electronic bidding requirement can be established where relevant for direct assignment).

The following capabilities associated with the electronic bidding process were implemented:

- Funds management integration
This was established such that the bidding process could begin only if sufficient budget were available. This is a requirement of Mexican law.
- Collaboration for strategic sourcing
The Collaboration Folders (cFolders) application, based on the mySAP Product Lifecycle Management (mySAP PLM) solution and enabled by SAP EP, supports collaboration covering strategic sourcing – specifically the bidding process. Collaborative folders enable collaboration among technicians, purchasers, and suppliers for developing technical documents, and integrate with the mySAP SRM bidding engine capability.
- Requirements aggregation
The sourcing cockpit, a capability of mySAP SRM, is used to consolidate requirements from multiple sources, such as production areas around the country, to determine how a single RFQ may be created. By aggregating requirements and creating a single bid invitation, Pemex Gas is more likely to get a lower price.
- Use of vendor lists
This simplifies vendor selection, ensuring that the buyer is easily finding vendors qualified to provide the material or services. The buyer can also view vendor attributes such as on-time delivery performance.
- Contract management for services
This enables creation of the services contract following completion of the RFQ process, using data already provided in the original bid invitation. The catalog is also populated with the contracted services.
- Analytics
Standard procurement business content is provided by the SAP Business Intelligence (SAP BI) component to enable comparison of different supplier bids (by law, Pemex Gas must select the most convenient supplier based essentially on lowest price, provided that the requirements are met). SAP BI is also used to support vendor evaluations (based on responses from purchasers to questions about vendor performance) and global spending analysis.

Transformation and Innovation in the Value Chain

The “Transformation and Innovation in the Value Chain” (TIVC) initiative originated in 2003. In May, Pemex Gas worked with SAP to conduct a review of its SAP implementation, which at that time included SAP® R/3®, mySAP™ Customer Relationship Management, mySAP Supplier Relationship Management, mySAP Supply Chain Management, mySAP Product Lifecycle Management, SAP Business Intelligence, and specific SAP capabilities for the oil and gas industry.

The company recognized the opportunity to better integrate its many SAP software-enabled processes and thereby further improve economic value added. The initial team reviewed key business processes, which included procurement, finance, human resources, planning, commercial sales, and plant maintenance. In October 2003, about 60 SAP consultants and developers were assigned to TIVC for a planned 15-month program, whose key focus became a measurable improvement in supply chain performance.

“The heart of TIVC is advancing logistics processes, but procurement has a special position in this program,” says Georg Herzog, TIVC project manager, SAP Consulting (Global Practice Unit Oil & Gas). “Improving procurement is essential to enhancing performance of Pemex Gas, and these improvements could be in operation well before the rest of the supply chain is optimized.”

Services procurement. In phase 2, Pemex Gas established services procurement via scenarios 1 and 2, as defined previously, for release orders and purchase orders. To this end, Pemex Gas established catalog entries for contracted services, which required a restructuring of the catalogs so that:

- A product number need not be included.
- There were fields for financial limits.
- Catalog searches related to services could be performed.
- Contract details were incorporated, ensuring that only previously agreed-to services could be performed.

For services procurement, most of the procurement process takes place in the services procurement module of mySAP SRM – in contrast to the implementation for materials procurement, which relies heavily on the mySAP ERP back end. Once the shopping cart is created, the purchasing documents derived from the shopping cart are copied to the mySAP ERP back end. Then, as with materials procurement, purchasing documents are processed, workflow routing is handled, and financial checks and postings are processed in mySAP ERP.⁴

Pemex Gas incorporated the following services procurement capabilities:

- Fixed services
Buyer specifies in advance the services to be procured (for example, a request to inspect a compressor).
- Limit orders
Buyer requests general services, but doesn't know exactly what tasks will be performed, and thus requires that a financial limit be set (for example, a request to repair a compressor). This is a more common method for services procurement, since services requirements often cannot be specified fully in advance.
- Order confirmation
This enables the supplier to confirm that services will be performed once an order is received.

- Funds management integration
mySAP ERP Financials integration was added, which provides the capability to ensure that the available budget is sufficient before a buyer is able to procure services. Also, new workflows enabled management confirmation before a services invoice could be paid.

Material procurement. Pemex Gas added electronic invoicing and advanced shipping notice capabilities to the phase 1 implementation.

Electronic invoicing provides the supplier with the ability to create an invoice directly from the original purchase order sent from Pemex Gas, and to transmit the invoice to the Pemex Gas SAP system. This capability greatly improves efficiency and eliminates manual processes. Also, since the invoice is created electronically, the possibility of errors, including incorrect matching of invoices and orders, is significantly reduced.

Likewise, the supplier has the ability to create an advanced shipping notice (ASN) from the original purchase order and return the document to Pemex Gas electronically. The ASN, which is created after the supplier packs and ships the goods, may hold truck waybill numbers, the weight and dimensions of products, and the exact dates that goods were shipped from the supplier. This information is used by Pemex Gas to plan warehouse receiving activities, plan future purchase orders, and deploy automatic receipt settlement processes with its suppliers.

⁴For services procurement, Pemex Gas had intended to establish a process in which the complete procurement process takes place in mySAP SRM – enabling full integration of services procurement capabilities with mySAP SRM. However, this process doesn't permit financial postings in mySAP ERP upon service-entry creation. As this type of posting is essential for the procurement process of Pemex Gas, the company opted for an implementation that permitted some integration with the SAP Supplier Self-Service component of mySAP SRM, while allowing the mySAP ERP back end to execute financial postings.

Centralized sourcing. As mySAP SRM was being implemented, Pemex Gas shifted from regional distribution to centralized strategic sourcing from Mexico City. Although the number of buyers remained constant, centralization supported identification of common requirements across the company, demand aggregation, and process simplification. Operational procurement could be executed using mySAP SRM in Mexico City or at plant sites. If a requirement originated at a plant site, any necessary requests for approval would be routed to Mexico City through mySAP ERP workflow.

Program Management

At Pemex Gas, IT works closely with the business units to ensure that business benefits are realized from implementations. IT may make suggestions about improvements, but ultimately the business is in charge of decision making; approval for key initiatives is obtained from the president of Pemex Gas.

Implementation Scope

There are about 1,000 users in Pemex Gas who may enter requisitions and orders for operational procurement processes, and about 60 buyers executing strategic sourcing processes. Every day approximately 20 requisitions and 20 invoices are created, with a range of 3 to 30 line items each. As of August 2004, there were about 70 suppliers in the system; about 6 suppliers are added per month, with a goal of establishing about 250 suppliers. Ultimately, the catalog will list about 15,000 goods and services.

The Role of SAP NetWeaver™

Pemex Gas deployed the SAP NetWeaver™ platform, SAP's open application and integration platform, to enable essential capabilities, minimize complexity, and provide a cost-effective platform for business process evolution over time. SAP NetWeaver components implemented at Pemex Gas are SAP XI, SAP BI, and SAP EP.

SAP XI provides open integration technologies that support process-centric collaboration among SAP and non-SAP components, both within and beyond enterprise boundaries. As shown in figures 5 and 6, SAP XI enables data exchange among key applications used by Pemex Gas and its suppliers.

SAP BI provides capabilities to identify, integrate, and analyze disparate business data from heterogeneous sources. As noted previously, SAP BI provides standard procurement business content to enable comparison among supplier bids, supports vendor evaluations, and facilitates global spending analysis.

“Now we are growing with Pemex Gas.”

Edith Lopez, Commercial Manager, Sichelub

SAP EP unifies enterprise applications, information, and services from SAP and non-SAP sources to support inter-company processes. SAP EP provides:

- Presentation services enabling suppliers and purchasers to use functionality from multiple applications without needing to know about the specific application that they are using
- Security services ensuring that supplier bids and catalog prices remain confidential

Benefits of Business Process Integration

In addition to enabling specific procurement processes, mySAP SRM enhances value through integration with other SAP capabilities at Pemex Gas. “[my]SAP SRM is a special procurement instrument, which allows one to procure well. But it doesn't tell you what to procure or how to procure it,” says Ramírez. “Through integration with other SAP capabilities, we have the added dimension of decision support. For example, the SAP procurement solution, through integration with plant maintenance capabilities [of mySAP PLM] allows us to determine how we should plan preventative maintenance. We can evaluate the importance of specific maintenance services to continuous operations, and compute the effect on economic value added of possible courses of action.”

OUTCOME

Pemex Gas achieved measurable outcomes, which will lead to improvements in economic value added. By shortening procurement cycle times, Pemex Gas is raising the productivity of procurement processes, lowering inventory, reducing full-cycle process costs, improving relationships with its suppliers, and enhancing customer service.

“With the tools provided through this implementation, purchasers have direct access to information about what they need to buy,” says Peralta. “Previously, people spent a lot of time trying to find part numbers, current prices, and so forth, and they had to economically justify each release. Now, with simplified approval processes and directly available information, it takes less time to plan requirements and complete purchases. We’re getting an immediate payback through better efficiency. And purchasers can spend more time on strategic sourcing, which provides substantial long-term benefits.”

Measurable Results

Pemex Gas achieved the following measurable results over the period from the third quarter of 2003 through the second quarter of 2004:

Price reductions

- Cut prices on one-year contracts and framework agreements with brand suppliers by 6% on average as a result of better planning, increased predictability of purchases, electronic processes, and consequent lower costs to suppliers
- Cut prices on electronic bids and strategic sourcing by 2% as a result of demand aggregation, automation, and collaboration with suppliers

“Price reduction is one of the biggest benefits we’ve obtained,” says Jorge Moreno, assistant manager of the pipeline business. “Because we have better predictability, the suppliers are willing to fix the price for one year, and we can get lower prices through volume purchases. Also, because of the integration with SAP

Supplier Self-Service, catalogs, and mySAP ERP, we have information on the most recent purchases and updated prices.”

Efficient operations

- Release order placement (scenario 1)
 - Lowered cycle time from order decision to order placement by 72% (from 25 days to 7 days)
 - Reduced costs by 20% and improved productivity by eliminating 64% of activities, automating 75% of formerly manual processes, and eliminating 60% of paper documents (such as advance shipping notices)
- Purchase order placement (scenario 2)
 - Lowered cycle time from order decision to order placement by 33%
 - Reduced costs by 20% and improved productivity by eliminating 17% of activities, automating 60% of formerly manual processes, and eliminating 33% of paper documents
- Public and restricted invitation bidding (part of scenario 3)
 - Lowered cycle time to set up the bidding process with selected suppliers for a specific requirement by 25%. The subsequent steps – finalizing the supplier and establishing the contract – cannot be shortened because the cycle times are mandated by law
 - Reduced costs by 13% and improved productivity by focusing on collaborative processes, eliminating 11% of activities, automating 41% of formerly manual processes, and eliminating 25% of paper documents

Cost reductions

- Reduced overall administrative costs by 2% – supported by simplified processes and an aggregation of demand
 - In one case, the company had 28 different bidding processes for the same material. Now, this is reduced to a single electronic bidding event for an annual contract.
 - Pemex Gas was able to sign fewer contracts with higher dollar amounts. Specifically, there was a reduction in the number of contracts from 2,447 in 2001 to 1,602 in 2003 as the total contracted amount increased from US\$59 million to US\$88 million.

Inventory reductions

- Reduced inventory of procured items by 25% as a consequence of shortened cycle times
 - Some stock reductions were greater than 25% (for example, chemical raw material stock was reduced from 40 days on hand to 15 days on hand).
 - Total maintenance costs were reduced by 9%, including a reduction of maintenance inventory costs by 9% and of obsolete materials maintenance costs by 2%.
 - Inventory reduction was supported by the ability of Pemex Gas to make more frequent and smaller purchases; in fact, electronic release orders in mySAP SRM increased from 273 in the third quarter of 2003 to 806 in the third quarter of 2004.

Benefits for Suppliers

Suppliers have indicated that they have achieved specific benefits as a result of the implementation. Two examples are Sicelub and Industria Química del Istmo.

Sicelub

The Grupo Sicelub Lubritech (Sicelub), based in Mexico City and with operations in Latin America, Spain, and Portugal, is a world leader in industrial lubrication systems for various industries including steel, cement, and energy. Sicelub has nine offices in Mexico and has been an important supplier to Pemex Gas since 1989. It provides turnkey systems to lubricate pumps, electric motors, and other machinery for the hydrocarbon processing plants of Pemex Gas, using a patented technology called “oil mist lubrication.” Sicelub also provides related lubrication systems and services.

Complex procurement process. Sicelub has no direct competitors for its patented technology, so its products can be acquired through the direct assignment process under Mexican purchasing law. Pemex Gas sends 30 to 40 purchase orders (with 3 to 4 line items each) per year to Sicelub. “The purchasing process with Pemex, a federal government entity, is very complex for suppliers. There are many steps involved by law, and it

could take over three months to establish a contract,” says Carlos Gonzalez, general manager of Sicelub. “Given that the federal budget is executed mainly in the second semester of a year, there is limited time for suppliers to respond to strategic sourcing requirements and ensure compliance with the law.”

“The implementation at Pemex Gas is one of the most complete implementations of mySAP SRM in the world.”

Oliver Merten, mySAP SRM Team Lead, SAP Consulting

Time and expense savings. Sicelub was one of the first suppliers established in the Pemex Gas supplier portal in 2003, and has seen many benefits. “Before, when we wanted to create a purchase order, we had to make contact with Pemex Gas by phone and fax. That was very time-consuming,” says Edith Lopez, commercial manager, Sicelub. “Now, I can sign on to the SAP portal to execute the purchasing process. Before, I had to go to the central office of Pemex Gas to present purchasing documents for legal authorization. Now, I don’t have to incur the travel time and expense, because processing through the portal provides the necessary legal confirmation.”

Standardized requirements. As mySAP SRM was being implemented, Pemex Gas standardized requirements for entry into the catalog. “Every purchase for similar requirements had to go through a committee at Pemex Gas for authorization,” says Gonzalez. “Before, this might happen 30 times per year for very similar specifications created by various Pemex Gas plant locations – because people in each location thought they had unique requirements and some improvements to offer.

“Now, because of standardization, the committee has to review just a single specification, about once a year. Therefore, our customers in Pemex Gas have a single, crystal-clear specification, which has been reviewed for technical and economic compliance with requirements. This is a better specification

overall, and our customers are more confident that our products will meet their requirements. This has also simplified the selling process. Before, we'd have to visit a customer 10 times to help them develop specifications. Now we may have to visit just once to complete a sale.

“But more important, consolidating specifications was a strategic imperative for us. We now have fewer different specifications to produce, better quality control, an ability to forecast accurately, and the capability to build some inventory. This allows us to reduce costs and improve delivery time – and we can sell more.” In fact, the consolidation of specifications has allowed Sichelub to reduce the engineering and production hours by half.

Next steps. In the future, Sichelub looks forward to broadening its use of electronic procurement processes to enhance its relationship with Pemex Gas. Sichelub expects to provide bids for other technology offerings and establish catalog entries for

“We discovered a lot of potential as we progressed with the implementation.”

Vicente Cordova, Chief Information Officer, Pemex Gas

its services. Sichelub is also working with Pemex Gas to further streamline catalog entry and other processes to facilitate joint cost savings.

The electronic relationship enabled by mySAP SRM has paved the way for a better business partnership overall and improved opportunities for both companies. As Pemex Gas is broadening its electronically enabled supplier base, Sichelub has initiated similar partnerships with other customers, such as Petrobras, an oil company based in Brazil. Says Lopez, “Now we are growing with Pemex Gas.”

Industria Química del Istmo

The mySAP SRM implementation at Pemex Gas has also provided benefits for commodity suppliers, which must manage costs very carefully.

Industria Química del Istmo (IQISA) is a Mexico-based commodity chemical supplier with 3 plants, about 200 employees, and 120 industrial customers. IQISA is owned by Cydsa, a leading Mexican industrial group, with business operations in plastics, fibers, textiles, and packaging, as well as commodity chemicals.

IQISA supplies caustic soda, a commodity chemical compound, to Pemex Gas under a two-year contract agreement. While there have been no major planning or execution issues associated with supplying caustic soda to Pemex Gas for nearly 50 years, IQISA is starting to face price competition from both Mexican and offshore companies.

Pemex Gas invited IQISA to become one of the first suppliers to participate in the SAP Supplier Self-Service implementation. Before mySAP SRM was implemented, IQISA staff members were asked to visit Pemex Gas to execute the legal aspects of each purchase order. The implementation eliminated most travel requirements, saving IQISA staff about 100 visits to Pemex Gas each year and substantially lowering costs. “The SAP implementation allowed our company to redirect staff time to more productive activities,” says Arturo Cabellero of IQISA technical sales. “The electronic processes for handling order administration are faster and more efficient than our previous methods.”

IQISA has been very pleased with the initial implementation, and plans to supply chlorine to Pemex Gas through a similar e-procurement arrangement. The company also plans to participate in electronic bidding for future contracts, which is expected to cut costs and enable IQISA to grow as a key commodity chemical supplier to Pemex Gas. The implementation reinforced the strong relationship between IQISA and Pemex Gas, and is motivating IQISA to seek similar electronic partnerships with other customers.

Other Benefits

Beyond quantitative improvements, other outcomes supported overall business objectives, as follows.

Enhanced transparency

Pemex Gas can provide government auditors and others with data to demonstrate fair bidding processes for contracts, invoice payment within 30 days as required by Mexican law, and conformance with other legal requirements.

Improved planning

In addition to lower prices from suppliers, improved planning has also facilitated the following:

- Suppliers are able to rely on Pemex Gas forecasts, enabling them to better plan deliveries – enhancing on-time performance and improving their ability to provide critical parts in emergencies.
- Transportation costs associated with inter-plant transfers have been reduced because the per-plant plans are more accurate.

Error reduction

The number of errors in orders, invoices, and so forth has been reduced because of single data entry into the systems of Pemex Gas and its suppliers.

Reporting

Managers receive spending reports at the cost-element level, improving control and enhancing decision-making abilities.

The mySAP SRM implementation has enabled Pemex Gas to build a community with its suppliers, and has positioned Pemex Gas for its future. “With every day that passes,” says Ramírez, “I feel more comfortable with what we are doing, and that we’ll be able to handle the competition.”

Benefits to Suppliers of the Pemex Gas mySAP™ SRM Implementation

Sicelub

- Eliminated travel for operational procurement
It is no longer necessary to travel to Pemex Gas to obtain legal confirmation for purchases, which can now be done through mySAP™ SRM
- Single specifications
Pemex Gas established a single specification for a purchase – versus as many as 30 before
- Cycle time
Reduced the sales cycle time by 70%
- Productivity
Reduced by 75% the amount of time suppliers needed to sell to Pemex Gas, and lowered by 50% the engineering and production manpower necessary to create products

Industria Química del Istmo

- Eliminated travel for operational procurement
Reduced number of trips to authorize contracts from 100 to zero
- Improved competitiveness
Better positioned to supply commodity chemicals because of current and potential future cost reductions

NEXT STEPS

Pemex Gas plans to extend mySAP SRM to cover the complete range of procurement activities with suppliers of all sizes. “Pemex Gas has contracts worth thousands of dollars and contracts worth millions,” says Georg Herzog, TIVC project manager, SAP Consulting (Global Practice Unit Oil & Gas). “The SAP solution can handle both. Efficiencies will continue to accrue, and the supplier community will be further developed as the company extends the use of mySAP SRM.”

In the future, Pemex Gas plans to further streamline processes, strengthen its partnership with suppliers, and support improvements to economic value added. Specific improvements include the following:

Buying by specialists. Pemex plans to establish lead buyers for specific types of items. By using the sourcing cockpit capability of mySAP SRM, Pemex Gas can separate requirements by product group and assign procurement to individual specialists. This will ensure that Pemex is procuring the right materials at the best prices.

Maintenance of catalogs by suppliers. Pemex Gas plans to let suppliers maintain electronic catalogs themselves, saving both the company and its suppliers time and money.

Supplier selection and item rationalization. In the initial implementations, Pemex Gas had made some progress in reducing the number of inactive and improperly qualified vendors in its procurement systems. In other cases, the number of vendors was increased to improve competition and lower prices.

Efforts to optimize the procurement database will continue. “We now have about 1,500 suppliers,” says Peralta. “Our task now is to find the best suppliers. Also, we want to rationalize the products and services we procure, since some of the differences in our catalogs are not justified. To further simplify the catalog

and facilitate searching, we want to define specifications for groups of items, establishing families of products with items containing common attributes.”

To support these efforts, Pemex Gas will deploy SAP Master Data Management (SAP MDM), a key component of SAP NetWeaver, to enable consistency of procurement information across its network. SAP MDM is being implemented as part of the TIVC program, and will enable centralization of data management and harmonization of all data used by business applications at Pemex Gas.

Electronic auctions and digital signatures. As noted, Mexican law prevents Pemex Gas from holding auctions and from using digital signatures to authorize contracts. Auctions would further reduce supplier prices, and digital signatures would further raise efficiency when establishing contracts. The company is working to have Mexican law amended so that the existing capabilities of mySAP SRM may be deployed.

Extend mySAP SRM across Pemex. The implementation of mySAP SRM in Pemex Gas is leading the way for others in the Pemex Group. Further implementation will benefit the entire group and will allow additional benefits to accrue to Pemex Gas. “We’d like our processes to be integrated across the company,” says Ramírez. “When we can aggregate procurement demand across Pemex, we’ll be able to increase economies of scale – as well as partnership with suppliers. When there is a deeper understanding of the complete set of requirements, everyone can benefit.”

LESSONS LEARNED

As the implementation progressed, the company found that the following tenets are key to success.

Procurement Is Strategic

In the past, Pemex Gas viewed the procurement process as an administrative activity that didn't materially affect business performance. As mySAP SRM was being implemented, company management acknowledged the strategic role that procurement plays in achieving profitable growth. Of course, establishing efficient procurement processes helps ensure cost containment. But it also enables improved plant performance, supplier community development, better customer service, and improved economic value added.

Invest in Detailed Up-Front Planning

Expectations for a fast and complete implementation were very high when the project started, but adjustments both minor and major were needed. "The implementation at Pemex Gas is one of the most complete implementations of mySAP SRM in the world," says Oliver Merten, mySAP SRM team lead, SAP Consulting, who was responsible for the phase 2 implementation. "We made comprehensive plans, but sometimes we left out details. The implementation would have proceeded even more quickly had we more fully defined specifications at the beginning of this project." One source of the issues was the bidding process requirements of Mexican law, which were unfamiliar to the implementation teams.

"mySAP SRM is a robust solution, and we were optimistic at the beginning that we could do this easily," says Cordova. "But there were a lot of details to pay attention to, and many interrelationships among the SAP solutions. Also, we have numerous stakeholders, and we find it's important to allow time to achieve consensus. Realizing the importance of up-front detailed planning will benefit our future SAP implementations."

Involve Business Process Owners

The role of procurement has been elevated in Pemex Gas, and management is involved in related decision making. "The first implementation of SAP in 1998 was IT-driven. So we had problems fully meeting the needs of the business, and these issues took time to resolve," says Peralta. "We've now learned to identify and involve business process owners, who have responsibilities for end-to-end processes – and for measurable outcomes associated with those processes."

Align Measurements with Outcomes

Pemex Gas did an excellent job of internal communications regarding mySAP SRM and the changes that it would bring, and the company promoted the benefits to the organization favorably. Moreover, the company found that measurable targets are essential to guiding an implementation toward outcomes that support the business. “We are starting to use a balanced scorecard to monitor our performance in a measurable way,” says Ramírez.

This approach lets Pemex Gas establish measurements and management processes covering financial performance (including economic value added), customer service, internal business processes, and organizational learning. The balanced scorecard provides a framework that aligns business strategy with the execution elements that are key to success. “The balanced scorecard approach allows us to understand where we’re getting benefits and where the returns are coming from,” says Ramírez. “This also helps us decide where to stop.”

Manage Scope

Deciding where to draw the line on implementation is essential to good project management. “We discovered a lot of potential as we progressed with the implementation,” says Cordova. “But this creates a problem: people find new features that they feel they really need soon. We needed to push back on new requests, in order to stay on schedule and on budget.”

Invest in Training and Testing

The go-lives at Pemex Gas were successful. However, management still believed that improved training and more testing in advance of the go-lives would have ensured that the solutions delivered value more quickly.



CONCLUSION

No longer are Mexico's oil rigs routinely topped by flares, burning off the natural gas associated with crude production. The gas has become too valuable – and is of strategic importance to Pemex as it faces opening of the natural gas market.

To increase production, the company is spending US\$300 million on large compressors – including a gargantuan one towed across the Atlantic from Spain – to capture the gas associated with petroleum drilling and to process it onshore. The company invested US\$1 billion to build a liquid nitrogen plant at Cantarell, where two-thirds of Mexico's oil is produced. The liquid nitrogen will replace the natural gas that is now too valuable to pump back into wells to force out more oil.

But the company has long known that increasing production is not alone sufficient to meet the cost structure and customer service requirements of the coming competitive environment, or its obligation to its owners – the Mexican people – to improve economic value added.

Through improvements to its strategic sourcing and operational procurement processes, Pemex Gas is addressing its broad set of requirements. The company will meet the new challenges by joining with its suppliers, which also have a stake in the future success of Pemex Gas.

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