



Control Systems International®



Petróleos Mexicanos (PEMEX) is the state owned and operated oil company of Mexico. PEMEX is the largest company in Mexico and provides almost half of Mexico's revenue. During the last three decades, Mexico's oil and gas economy experienced several boom and bust cycles. These fluctuating economic changes prompted PEMEX to examine ways to increase its internal efficiencies. If PEMEX could find ways to distribute fuel more efficiently, that could help stabilize the market shifts and meet the growing energy demands.

In the late 1980's PEMEX engineers realized that making its downstream distribution terminals more productive and accountable was key to meeting Mexico's increasing fuel needs. PEMEX sought out experts in the field of fuel terminal automation who could meet the strict requirements set forth by the Mexican government. As a result of their investigation, one company stood out as the obvious choice: **Control Systems International, Inc. (CSI)**

Project Profile: **Petróleos Mexicanos PEMEX**

FUEL-FACS⁺ Provides PEMEX Accountability and Control



In 1992 PEMEX contracted with CSI to perform a pilot modernization project at the Victoria distribution terminal. CSI determined what instrumentation, hardware and software would be needed for the project. CSI engineers worked with PEMEX engineers to configure **FUEL-FACS®** facility operations and business system to meet PEMEX's needs. CSI assisted PEMEX engineers in defining a Functional Technical Specification (FTS) for the automation system. That core specification, with minor updates, is still used today as a benchmark for all terminal automation projects at PEMEX.

The FUEL-FACS system simultaneously controlled presets, valves, pumps, flow meters, tank gauging, gate security, fire and safety, Emergency Shutdown (ESD) and all subsystem operations. It provided detailed accounting and receipt of all product movement. FUEL-FACS was designed to integrate into PEMEX's existing infrastructure to reduce costs. CSI then installed the new components, conducted testing, commissioned the facility and trained the operations personnel. After the Victoria terminal automation proved cost effective and efficient, PEMEX contracted with CSI to install identical systems in its Guadalajara (El Castillo), Irapuato and Mexico City Satellite Sur facilities.

In 1992 FUEL-FACS was the state-of-the-art control system technology for fuel distribution terminals, but CSI engineers did not stop there. Over the next few years CSI improved the system with the advent of Windows NT and PC-based technology. In 1999 FUEL-FACS⁺ was born.

FUEL-FACS⁺ utilizes the latest technology to create a robust system designed to meet all the needs of complex fuel distribution terminals and bulk storage facilities. By integrating facility control operations with product accounting, FUEL-FACS⁺ greatly improves a terminal's efficiencies.

Welcome To The New Millennium

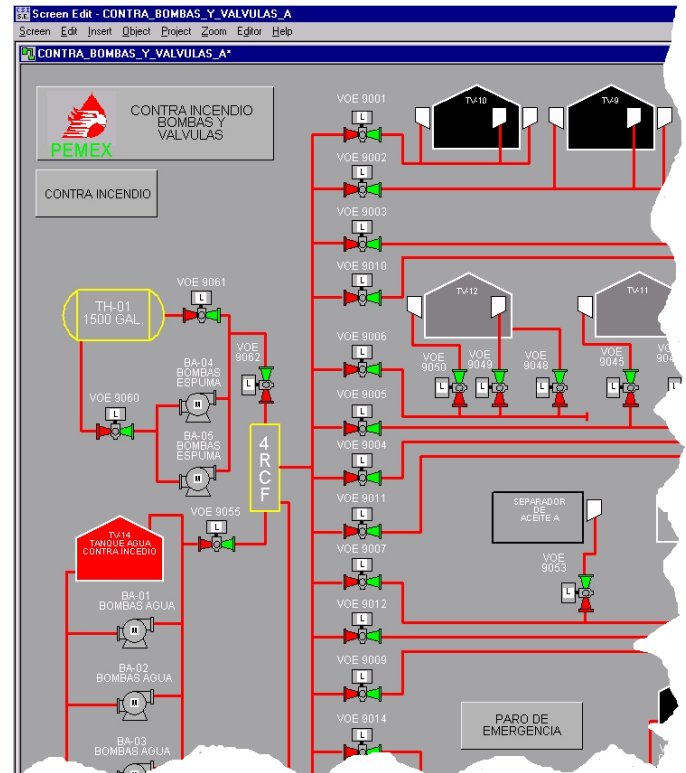
With the ever increasing demands for energy in 1999, PEMEX was eager to cost effectively upgrade those four busy terminals with FUEL-FACS+. From the time of the first FUEL-FACS+ installation CSI engineers continually made improvements to the software. Those improvements increased the functionality of FUEL-FACS+. The enhanced software also saved hundreds of man-hours in installation time. In less than six months, CSI had FUEL-FACS+ integrated into PEMEX computers at all four sites.

To make monitoring and managing the operations even more user-friendly, CSI implemented FUEL-FACS+ facility business and operations systems in Spanish. That resulted in even more reduced costs for training and on-going system support.

With FUEL-FACS+ PEMEX's costs of operations, maintenance, troubleshooting and dispatching have been greatly reduced. FUEL-FACS+ allowed PEMEX managers to accurately inventory the facilities using real-time graphic displays so they could reduce waiting time and meet demand more quickly. After a driver loaded his truck, an electronic bill of lading was instantly issued and an invoice could be sent in a matter of minutes shortening the business life-cycle.



FUEL-FACS+ monitors and controls the loading of more than 2,200 trucks each day for PEMEX



Real-time graphic displays in Spanish (Partial Screen)

FUEL-FACS+ also integrated safety features such as fire detection and suppression, gate security and password protected access to screens at each facility. The systems featured extensive logic interlocking to ensure that operator error could not cause spills and product contamination.

Following the successful installation at the first four sites, PEMEX contracted CSI to install FUEL-FACS+ in four more facilities. 12 bays in Culiacán, 12 bays in Zapopan, 12 bays in Mazatlán, and 40 bays in Cd Madero. The Mazatlán terminal also has a marine off-loading facility where product is sent via pipeline to the truck loading racks about five miles away.

As PEMEX faces the formidable challenges of global economics and increased energy demands, CSI will be available to facilitate the changing needs of its customers. With CSI's innovations and support and FUEL-FACS+ monitoring and operating these busy terminals, PEMEX has a huge head start in the energy race of the future.



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