



# AUTOMATION OF STORAGE AND DISTRIBUTION TERMINALS

The automation of a hydrocarbon storage and distribution terminal responds to the need to increase efficiency, reliability and security in terminal operations.

The integral automation of this type of facility includes the measurement, operation and control of all plant sub-systems, such as storage tanks, product reception and dispatch bays, pumping systems, access control and the Plant's security systems.

Automation also includes the integration of plant administrative systems for ordering and invoicing processes as well as portals for client assistance and management.

The main objectives of these systems are:

- Achieving the maximum possible efficiency in terminal operation, minimising manual operator work and increasing productivity. Required times are cut for each dispatch and the use of loading positions is improved.
- The real time control and monitoring of the balance and stock for each terminal product, as well as loading and product dispatch operations.



- Ensuring reliability and quality in the delivery of the products to the final client. Increasing "purchaser" confidence through standardised and certified dispatch measurement.

- Providing improved security for the plant, the environment and the areas surrounding the facilities.

Furthermore, SICE has successfully implemented these systems at 8 terminals of the public company Petróleos Mexicanos, including the required automation and computing infrastructure to create a solution called SICETAD, which has been refined with experience accumulated over the years.

## THE SICETAD SOLUTION

SICETAD is a system used for the comprehensive automation of Hydrocarbon Storage and Distribution Terminals.

SICETAD is installed in each Terminal for the efficient and secure operation of all Terminal systems.

This system can also be installed as Central Dispatching for the support of all on-site installed systems.

The facilities can be monitored and controlled remotely from the central station, ensuring system availability 365 days a year.

The Terminals main sub-systems are automated:

- Tank storage
- Dispatch and loading arms
- Valve automation
- Pumping systems
- Access control
- Security systems

All these subsystems are unified under the same Monitoring and Control platform which enables interaction between all the systems in an efficient manner.

These systems also include integration with the plant's SAP/R3 administrative systems for ordering and invoicing processes.

## TANK STORAGE

The purpose of supply tank measurement (remote measurement) is to measure the level of hydrocarbons, the average temperature and the water level in the tank in real time; this has been achieved with excellent results with two different technologies, through displacement (servo) and ultrasonic radar type meters, depending on selection of tank characteristics.

## DISPATCH AND UNLOADING ARMS

The dispatch arms are completely assembled and manufactured by SICE. With these bottom-filling systems, it is possible to have measurement and control in a secure and reliable manner for the dispatched hydrocarbons.



Unloading arms can be assembled and manufactured in accordance with client needs, or can arrive integrated in skid type equipment.

With the unloading systems offered by SICE, there is complete unloading and run-off for each tank truck, offering more precise balances.



## PUMPING SYSTEMS

Automation of the pumping system involves the automatic start and stopping of each pump so that the system distributes the use and operation of each one for more efficient use.

## VALVE AUTOMATION

This is normally carried out using electric actuators installed in the inlet and outlet valves in storage tanks, distribution heads and all other valves which have a critical and relevant role in the dispatch and reception at the terminal, offering advantages in response times, security and reliability.

## ACCESS CONTROL

The access control system is made up of physical entry-exit barriers, a tank truck detector, transponder reading antenna and keyboards. This is all monitored by a Monitoring and Control system which gives the required permissions for the entry or exit of the unit, ensuring control of entries and exits and the times and movements of tank trucks.

## SECURITY SYSTEMS

Security systems include all the necessary instrumentation to detect smoke in offices and storerooms; IR type detection of explosive mixtures and fire in operational areas and detection of fire through fuse plugs in the storage tanks.

In addition they include active systems for the automatic extinguishing of fires in storage tanks, filling zones, unloading and pumps using SIL 3 or SIL2 systems.

## INTEGRATION OF SUBSYSTEMS

