

Connected

Solutions for Enhanced Terminal Operations

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Whether it's the gas that drives our cars or the oil we burn for heating, petroleum products are something in which we all have a stake. That's what makes the efficient management of the terminals that distribute them so important.

Being able to respond quickly, and efficiently, to market changes depends on terminal managers having access to timely information. But here there is a problem: The systems that worked so well in the past now hinder information flow and make it impossible to unify operations, yet they're much too costly to replace. ABB's Industrial^{IT} solutions for Enhanced Terminal Operations protect the industry's installed assets and support future growth by automating information flow and integrating operations worldwide.

The successful transportation and distribution of oil and gas can well depend on how skillfully the industry handles some obvious contradictions. For example, terminal owners and managers must take a global view yet respond immediately to even the smallest market changes. To control operating costs, they have to extract maximum use out of old equipment and yet need state-of-the-art technologies to remain competitive. And they must deliver materials defined as hazardous to remote sites while complying with stringent governmental and environmental regulations that can vary from location to location. Finally, they need constant access to reliable, enterprise-wide information that tells them everything about the status of ongoing and finished operations, about suppliers and customers and stock, all without jeopardizing the security of the information and the terminal itself.

In the last decade, these contradictions have increased as changes swept the industry. These included a basic shift in the business model. Instead of buying product in advance and holding it until it is sold (buy-hold-sell), terminal owners now wait until an order has been received. They buy and hold as little inventory as possible, shipping it quickly as soon as an order arrives (sell-sourceship). This new business model gives the edge to terminal owners with the best information about, and the fastest response to, changes in worldwide availability and demand. Wafer thin margins are quickly jeopardized by any error or delay.

As the world's leading supplier to the industry, ABB understands these pressures, and has developed products, services and technologies specifically to manage the movement of petroleum and chemical products through pipelines, vehicles

and terminals. With a portfolio reaching from individual sensors to complete e-Business solutions, ABB strives to improve efficiency and profitability through:



- Flexibility: ABB solutions accommodate any size of terminal in any location, with any business, transportation and security requirements.
- Compliance with global industry regulations and standards, including certified and pre-validated components.
- Backward compatibility to existing systems.
- Provision of an upgrade path to automated, intelligent enterprise management and planning.
- Maximization of our customers' return on investment.
- Worldwide support, with expertise that is always available and always in tune with the local situation.

Every terminal in the world may have a unique business scenario, reflecting the configuration of its legacy systems and instrumentation, its ownership, the products it handles, the way it receives

and transports those products, its suppliers and customers, and the environment it operates within.

Instead of forcing terminals into a mold, ABB's solution for Enhanced Terminal Operations offers an Industrial^{IT} portfolio with the flexibility

needed for adaptation to the needs of terminal owners.

Tracking 32 million tons of product

Managing terminals involves regularly dealing with a variety of transportation vehicles, customers, suppliers and equipment. That makes for complex communications both within and outside the terminal. Take, for example, CLH (Compañía Logística de Hidrocarburos), Spain's leading storage, transport, and distribution company for oil byproducts. CLH services airport, ocean and land markets with more than 32 million tons of products, arriving from and departing for locations around the world, in every sort of vehicle from tank trucks and railroad cars to airship refueling units and barges. At one point, its very success created several problems.

First, the terminal's original equipment came from various vendors with different approaches to technology. So information from tank gages, for example, could only be collected on paper and passed along by hand, a process that is slow and error-prone. Second, without timely and accurate information, no one could be sure that the vehicles and drivers arriving at the terminal were authorized to enter and were loading up correctly before they left. Third, despite

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all the paperwork – or, rather, because of its sheer volume – the company couldn't predict the movement of products, orders and vehicles. No one had a clear overview of global operations.

From ABB, CLH received an information management system that unifies terminal operations and gives management enterprise-wide control. Because ABB software is built with a truly open architecture and is protocol neutral, the pre-existing subsystems did not have to be replaced; instead, they're now merged and coordinated under the ABB control system, which automates activities as varied as loading operations, verification of safety conditions, document preparation and invoicing. Various applications within the system:

- Control product quality to prevent contamination, guarantee the required flow, and optimize startup and shutdown of pumps.
- Automatically plan and carry out product movements.
- Identify all transport arrivals with magnetic cards, checking authorizations to enter the plant and tracking movements inside the plant.
- Automatically ensure the right vehicle leaves with the right shipment and with complete documentation.
- Allow remote access to enterprise-wide information for authorized personnel.

With ABB technology in place, the terminal is experiencing major improvements in reliability, accuracy and speed at every stage of its operations. Even from its location in Madrid, CLH Control Center can oversee 41 terminals, plus tank farms and loading areas, throughout Spain. And ABB's system includes a direct migration path upward to a full Industrial IT manufacturing execution system, so that CLH is ready for whatever the future brings.

Creating a truly connected enterprise

Successes like CLH's helped convince Petrobras Distribuidora of Brazil to select ABB's solution for Enhanced Terminal Operations for ten different sites in Brazil. Raul Delgado, Project Manager for Petrobras Distribuidora, says, "ABB's ability to provide a complete

solution/product for terminal automation was an important consideration. Petrobras expects better optimization in fuel loading and faster production, plus the ability to integrate all of our terminals in Brazil."

For Petrobras, ABB will provide loading base control, basic and detailed design, installation, integration, training, services and maintenance at all ten locations. Petrobras will be able to unify and optimize its operations, with real-time supervision, online orders, online scheduling, and online programming of terminals. Key elements of ABB's solution for Enhanced Terminal Operations at Petrobras are:

- A central location for all loading activities
- Automatic preparation of documentation
- Accurate monitoring of product loading, storage, and ownership

This solution also includes an interface to certified weighing and measuring equipment as a standard feature.

ABB's Industrial IT solutions will connect Petrobras to its widely scattered terminal locations and to ABB. Ensuring it always has immediate contact with its own enterprise, its supply chain, and ABB's global expertise.

Keeping terminals and information secure

Terminal owners are concerned about two types of security: access to the physical terminal and access to information. Terminal security is complicated by the multitude of products, suppliers, buyers, vehicles, drivers, regulations and procedures that interact at each terminal. Moreover, some or all of those elements are bound to change over time.

Information security is complicated by the many different levels of people who need access to information, including operators, suppliers, drivers, the terminal owner and government agencies. Whether the information is needed for an invoice, a tax form, insurance, process control or planning, it must be available only to authorized personnel.

ABB's Industrial IT solutions approach these problems directly. Access to the plant is controlled through such security devices as eye scans or hand scans for driver recognition, magnetic cards that regulate access to loading areas, and (semi-)automatic recognition of vehicles (to verify, for example, that a truck belongs with the driver, has the correct number of compartments, and is the correct vehicle for the shipment). When they enter the terminal, drivers automatically receive specific instructions in their



own language ('go to loading area 12'). Before they leave the terminal, they automatically receive the documentation they need. In fact, they aren't allowed to leave until they fulfill the instructions and sign off on the documentation.

As important as those security devices are, they would be useless if they couldn't adapt easily to change – the assignment of a new driver, for example. Therefore, ABB configures Industrial IT systems using ABB's Aspect Objects, an intuitive configuration tool to control, monitor, and model the terminal.

By integrating information from a variety of sources, Aspect Objects create an accurate and complete image of the terminal. The terminal, its data and its components are presented as graphic objects, and those objects can be changed and rearranged by the terminal's own authorized engineers, without outside help. Because load, order and security procedures are available as templates, they can be adapted as needed to match the actual situation in the terminal. Aspect Objects support multiple languages and any combination of products, recipes and equipment.

In addition, all information on every transaction (who loaded what product, from which supplier, stored in which tank, and so on) is immediately available in the form of tables, graphics and reports, and is fully accessible even from remote locations. Terminal owners and managers have the data they need, when they need it, to track, predict and reconcile product receipt, storage and dispatch.

Yet, all this information is guarded as securely as the terminal itself. Access is based on authority levels and passwords; there's also a clear audit trail and enforced validation procedures.

Building flexible, responsive, reliable solutions

The equipment, applications and solutions that constitute ABB's solution for Enhanced Terminal Operations are compliant with and work in line with the appropriate industry standards and reg-



ulations. These include current Good Manufacturing Practices (cGMP), Good Automated Manufacturing Practices (GAMP), the American Petroleum Institute (API) standards, the American Gas Association (AGA) standards and environmental regulations. Precision measurement devices are certified calibrated. Hardware and software components are pre-validated. Automation systems and modules support standard database environments (such as Oracle and SQL Server) and work on Windows platforms.

Whether terminal owners need automated pump controls or web-based communications, ABB's solution for Enhanced Terminal Operations allow them to reduce inventory and operational costs, improve customer service, respond quickly to the marketplace, ensure the safety of their operations, comply with industry and government regulations – and still protect their assets.

When Akzo Nobel Base Chemicals decided to automate operations at its

terminal in Botlek, Benelux, it chose ABB because "ABB offered the best value for the money, had the knowledge required to do the job, and... the flexibility to operate the terminal within our own parameters."

In addition, it could depend on ABB's global support and service. ABB's world-

wide locations respond to new challenges quickly and in ways that

ABB's solution includes a direct migration path upward to a full Industrial IT manufacturing system.

are appropriate to local conditions. In an industry where even the basic business model has been overturned, terminal owners and ABB have proven that flexibility, efficiency, and reliability are the winning responses to change.

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