

# Case Study



## **APM Terminals Pier 400 – Los Angeles, CA**

**One of the worlds largest container terminals enhances its Navis SPARCS TOS to leverage new Optical Character Recognition (OCR) and Position Detection Systems (PDS) to automate crane, rail and yard operations.**

### **The Client**

APM Terminals, part of the A.P. Moller/Maersk family, is a leading global container terminal operator with activities in more than 30 ports worldwide, generating an annual throughput of about 15 million twenty-foot equivalent units, or Teu's. The Pier 400 facility is constructed on 484 acres of reclaimed land in Los Angeles Harbor and provides a capacity of over 8000 wheeled and 15,000 grounded containers.

### **The Challenge**

Faced with limited space and expanding cargo volumes, highly efficient identification and tracking of containers– within gate, yard, vessel or on-dock rail operations– is absolutely critical to providing smooth, fast and effective customer service in today's terminal environment. In recent years automated systems using OCR were introduced at Pier 400 to reduce the time needed for a tractor/truck to enter or exit the facility. As the technology has proven to benefit gate operations, other areas of the terminal still rely on manually intensive processes to identify containers and confirm their movements within the load/discharge operations of vessels and intermodal trains.

What the APM Terminals management envisioned was the use of OCR and GPS-equipped automation systems to not only identify the containers as they arrived and departed the facility, but also to track the movements of the containers as they passed from one operational area to another (e.g. from a quay crane to the yard). The challenge facing them was to not only find solution providers who could technically achieve each task with very high degree of reliability and accuracy, but who could also provide real-time data integration to SPARCS to utilize the Equipment Control functionality in a more automated fashion.

For their Automation Project to be successful, an integrated, multi-vendor solution would be required to:

- **Identify the container ID during vessel load/discharge**
- **Associate the container ID to the delivering/receiving tractor at the crane**
- **Automate and maintain train inventory and location information (what containers are present and where they are within the facility).**
- **Automatically track location of all equipment and containers within facility**
- **Eliminate need for manual confirmation of container movement, tracking or work order completion in 3 major operational areas (crane, rail and yard)**

## **The Solution**

The project goals were to increasing inventory accuracy and safety, while at the same time decreasing labor costs and manual data input errors within the bounds of local labor restrictions.. APMT chose to implement proven systems from APS Technology Group of San Diego, CA and Satellite Telemetry (Sattel) of Australia. The integration of these cutting edge technologies with an upgraded version of the Navis SPARCS TOS using a real time XML interface would ensure timely and secure information flows allowing containers to be tracked and confirmed as they move into, out of and within the facility.

### ***APS Scope of Work***

Provide a Crane OCR system on the terminals 14 ship-to-shore gantry cranes to identify containers during load and discharge operations and transmit the data via XML to the PDS system for container-to-tractor association. This process would automate the traditional hatch clerk function at each crane and allow for the real-time generation of parking instructions/work orders to the tractor driver.

Provide a Rail OCR Portal System to identify and sequence containers and railcars as they arrive and depart the terminal and transmit the data via XML to SPARCS to aid rail operations planning.

Provide a Rail Equipment Tracking (RET) System to visually track and maintain the GPS location of all railcars as they move within the 12 track on-dock rail facility and transmit the location data to the PDS. This process would automate the traditional inventory clerk function and allow for the automatic creation of work orders to load or discharge the train. As each train is worked, the PDS system would in turn be able to automatically confirm the completion of each work order by comparing the GPS coordinates of the container it currently has with matching location data transmitted previously by the APS system.

### ***Sattel Scope of Work***

Provide a GPS-based Position Detection System (PDS) to track the location and activity of all container handling equipment(CHEs). This includes internal tractors, top loaders, Rubber Tired Gantry (RTGs) and Quay Cranes. The PDS advises the TOS of all CHE initiated container and chassis movements within the facility.

Receive Rail Equipment Tracking messages from APS and associate that data to the related rail yard CHE activities, to determine the containers being moved to and from rail.

Receive Crane OCR information from APS, and incorporate the container identity into the overall Vessel PDS system which is tracking the movement of containers moved to and from the vessel.

### ***Navis Scope of Work***

Enhance SPARCS and its Equipment Control function to receive the OCR and PDS messages and automatically transmit and confirm container routing information and work order instructions to tractors and other CHEs in real-time.

Provide a new XML interface that would enable APS and Sattel to communicate the container identification and location data in real-time.

### **The Result**

The combination of state-of-the-art systems from APS Technology and Sattel closely integrated with an enhanced SPARCS TOS will provide APM Terminals with a level of automation and cargo visibility not seen before in US terminal operations. By automating manual verification processes like container ID and inventory, APMT will gain a higher visibility to the cargo in the terminal. Most importantly, they will be well placed to more efficiently process the ever-increasing container volumes without adding personnel and without expanding their facilities.



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