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Managing Marine Logistics: What you don't know CAN hurt you!

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Overview

In 2003, the major refineries of the Sabine-Neches Waterway in Southeast Texas began seeking options for improving efficiency of vessel movements and reducing demurrage costs. Aggregate demurrage for the four refineries on the waterway was estimated at over \$30 million annually.

To attack this problem, the refineries partnered with a maritime technology company to develop a system that would:

1. Provide complete visibility of all waterway vessel activity to stakeholders
2. Allow for collaboration between terminals, vessels, tugs, and other stakeholders to reduce delay
3. Collect objective data to drive policies, procedures, decision-making, and vendor compliance

The resulting system, called PortVision, was deployed in the region in early 2007. Since then, the results have been compelling. There are now over 300 regional users leveraging PortVision to increase efficiency, reduce costs, and enhance safety and security of the Sabine-Neches Waterway. Since its introduction, PortVision has changed the culture of the waterway by providing visibility and transparency of all vessel activities to all stakeholders.

This paper will describe the PortVision initiative within the Sabine-Neches Waterway and demonstrate how the four major refineries along the Sabine leveraged PortVision to drive efficiencies and significantly reduce demurrage.

The Key to PortVision: Leveraging New Technology

Since 2005, the US Coast Guard has required all vessels over 60 feet to transmit a VHF-based collision avoidance signal, known as AIS, or Automatic Identification System. AIS was initially developed and implemented to enhance navigational safety by providing visibility within the wheelhouse to all area large vessel activity. In 2005, the Coast Guard mandated that ships continue to transmit their AIS signal when transiting ports and many inland waterways. AIS data includes vessel position (lat/long) as well as other key vessel-related data.

This change in legislation presented a new opportunity for the Sabine refineries. For the first time, users could leverage AIS signals to support more efficient business practices. It was now possible to deploy an information system that provided real-time vessel locations and recorded vessel movements for *all* commercial ship traffic along the waterway. Most importantly, this could be accomplished without the need for *any* manual human data entry.

The major refineries funded an initiative to place AIS receivers along the Sabine-Neches Waterway and incorporate the receivers into PortVision. PortVision processed vessel position data from these receivers directly into a web-based system that was accessible to all authorized stakeholders.

In addition to providing real-time vessel location data, PortVision archived information about all vessel movements, including every terminal arrival/departure, port arrival/departure, and passings by key points-of-interest. PortVision offered users the ability to set e-mail and mobile text message alerts so that they could be notified of arrivals and departures in real time – even if they were away from their office computers. PortVision also provided animated playback and historical reporting, allowing users to analyze past events and generate documentation suitable for demurrage analysis, vendor and partner compliance, negotiation, and even litigation.

Finally, PortVision provided a collaborative platform that allowed agents, ship owners, and terminal personnel to more effectively schedule dock resources. Agents could use PortVision to easily request a call on a terminal and exchange necessary documents directly through the system. By doing so, dock scheduling information was made visible to other stakeholders to drive efficiencies, while proprietary information about each call was kept strictly confidential within the system.

Observed Benefits

Since deployment of PortVision in early 2007, a number of key benefits were realized:

- Terminals now operate more efficiently based upon real-time, objective information
- Labor and resources are optimized based on actual vessel movements
- Users can generate reports to understand and drive best practices regarding ship, tug, barge, and pilot activities
- Terminals and all stakeholders now have near-perfect visibility and transparency of vessel movements, resulting in a new “integrity-based culture” across the waterway
- Most importantly, demurrage has been reduced

Prior systems that attempted to achieve these benefits often failed due to high software costs, onerous data entry requirements, and difficult user interfaces. However, by leveraging both AIS and Internet technology, PortVision was able to implement a collaborative waterway information system that provided value to all users without the cost, time, or labor required by earlier systems.

How PortVision Reduced Demurrage along the Sabine-Neches Waterway

Demurrage along the Sabine-Neches Waterway results from a number of factors:

- One-way traffic flow
- Weather
- Tug and pilot availability
- Availability of labor and service providers
- Vessel detention due to maintenance, cargo, etc.

There are some contributors to demurrage (e.g. weather, etc.) that cannot be effectively addressed by any system. However, the focus of PortVision was to create an environment along the waterway that would enhance the efficiency of all stakeholders who played a role in operational activities. With that goal in mind, PortVision contributed to demurrage reduction in four key ways:

1. Optimized resources based on actual vessel locations and movements, reducing conflicts and minimizing delays associated with terminal calls
2. Delivered business intelligence and data analytics that allow terminals to understand the sources of demurrage and make adjustments in business practices as required
3. Provided objective data to allow terminals to effectively dispute erroneous demurrage claims
4. Drove an integrity-based culture

Each of these demurrage benefits is described below.

Optimizing resources

By using PortVision, stakeholders along the Sabine-Neches Waterway were finally given real-time, unbiased information about the actual vessel location and arrival/departure status of every vessel along the waterway. Terminals were now able to optimize labor and resources, and marine service providers could now schedule resources on a more just-in-time basis. In addition, the real-time mapping and collaborative features of PortVision allowed users to view vessel schedules and determine berth availability without the need for countless phone calls and e-mails. The result was an integrated system where terminal operators, vessel operators, and service providers optimized their individual activities based on real-time information, leading to efficiency gains for all.

Business intelligence and data analytics

PortVision's reporting features allowed terminals to identify the sources of demurrage, which led to corrective action that drove best practices to minimize demurrage and future delays. For example, PortVision was used to analyze tug and pilot movements in order to understand the dynamics of inbound vessels from the Sea Buoy. Users also were able to benchmark transit times against other users and different time periods. PortVision stores up to five years of information into a user-accessible data warehouse, allowing authorized users to generate historical reports and view animations of the waterway to understand the sources of delay and demurrage.

Disputing demurrage claims

Since PortVision captures vessel movements that are transmitted from individual vessels, the system serves as a defensible, objective record of vessel movements. This provides a compelling toolkit from which to dispute erroneous demurrage claims.

For example, consider the common practice of early tenders of Notice of Readiness (NOR). Within the Sabine-Neches Waterway, it was common practice for ship captains to tender NOR four or more hours before actually arriving at the Sea Buoy. This was done, presumably, to get "in queue" with pilots and tugs in an effort to minimize wait time at the Sea Buoy. However, this

practice starts the “demurrage meter” running early for the destination terminal. This results in thousands of dollars of demurrage being erroneously claimed, and subsequently paid by the terminal.

PortVision made it easy to quickly retrieve the actual time each vessel arrived at the Sea Buoy. Armed with this information, demurrage analysts at each refinery were able to view the arrival time at the Sea Buoy, compare it to the demurrage claim, and reject or revise the claim based on the actual data. For the first time, terminals had the objective data they needed to stop the practice of “rubber-stamping” the payment of erroneous and over-stated demurrage claims.

Driving an integrity-based culture

Before PortVision was deployed, refineries along the Sabine relied on others for information about vessel status and movements of barges, ocean-going vessels, tugs, and pilots along the waterway. However, many of these long-time practices quickly changed once PortVision was deployed and the terminals gained real-time vessel visibility. For the first time, refineries had near-perfect information about the location of their barge charters. They also had perfect information about vessels at the Sea Buoy, and tug and pilot locations. Though PortVision has been deployed for just one year in the Sabine, its users are already reporting that the *culture* of doing business has changed, due largely to the fact that the playing field has been leveled and all users have visibility to vessel movements on the waterway.

Case Study: Actual ROI at Total Petrochemicals

At Total Petrochemicals, actual results were compelling. In the first year of operation, PortVision led to a reduction of over \$1 million in barge demurrage. As of the writing of this paper, an analysis of demurrage from ocean-going vessels and the total ROI from non-demurrage efficiency gains has not been completed. However, it is estimated that the value derived from the use of PortVision at the Total refinery is far in excess of the measured \$1 million once all savings are factored in.

In some cases, it is difficult to pinpoint whether PortVision is the sole reason for the demurrage reduction. However, since barge operators and other service providers have learned that the refinery has both real-time visibility and historical reporting capabilities, it is believed that many of the practices of vendors, partners, and customers that previously resulted in increased demurrage have ceased.

Next Steps for PortVision in the Sabine

As of January 2008, PortVision is being utilized by over 300 users in and around the Sabine-Neches Waterway. The major refineries continue to fund PortVision access for all stakeholders along the waterway, as the enhanced visibility and transparency provided by PortVision has resulted in greater efficiency and reduced costs associated with marine transportation activities at the terminals.

New PortVision activities scheduled for 2008 include:

- Enhancing the system's predictive ETA functionality to better support barge and vessel scheduling
- Integrating battery-operated satellite tracking units on barge term charters to incorporate barges directly into the PortVision display (note that pushboats are already visible within PortVision)
- Enhancing the system's reporting and data analytical capabilities
- Continuing the expansion of AIS coverage beyond the Sabine and across the Gulf

In addition, Total Petrochemicals is now in the process of integrating the PortVision system with the demurrage analyst's desktop to provide real-time interfaces to each barge and ship charter document. This integration will allow the analyst to forecast potential demurrage claims immediately upon completion of load or discharge, rather than react to a claim after it is filed. An added benefit of this integration will be a "pre-analysis" of a potential claim while a move is fresh in the minds of the trader, scheduling, and dock personnel directly involved with the move. This approach minimizes the need for these personnel to remember the specific details of a move 60 to 90 days later, when a claim arrives.

Total Petrochemicals and the other major refineries along the Sabine are committed to continuing to extract maximum value from the PortVision initiative. This includes calculating and measuring ROI from the initiative, and enhancing the system to maximize value to all stakeholders.

More information about PortVision and the Sabine initiative can be found at <http://www.portvision.com> .

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