

Data Collaboration with marinetraffic.com for Remote Monitoring of Port operations using AIS

INTRODUCTION

The Automatic Identification System (AIS) technology has developed from a simple navigational and situational awareness tool designed to improve safety at sea to become the backbone of a global ship tracking network. Today, over half a million vessels use AIS to transmit their location, which is collected by a network of receivers deployed in over 140 countries and 40 million users track vessels annually through the MarineTraffic platform alone.

AIS no longer merely helps to protect sailors. As the network of receivers grows and methods of analysis become increasingly sophisticated, AIS data is able to provide ever-more accurate and valuable information to a variety of users; from helping maritime businesses increase efficiency to allowing financial analysts and hedge funds to monitor global commodity flows.

Background and Problem:

The idea and initiative to acquire and install an Automatic Identification System (AIS) for Vessels at the Base Port of Surigao and other ports under the Port Management Office of Surigao (PMO Surigao) largely came about during the search, rescue and retrieval operations conducted after the ill-fated M/V Maharlika II sank off Pintuyan in Southern Leyte on 13 September 2014 while sailing en route to the Port of Liloan from the Lipata Ferry Terminal.

Seeing the AIS at work and how it made a tremendous difference in the conduct of Search and Rescue (SAR) for the MV Maharlika II, PMO Officials were convinced of the benefits of installing shore-based stations at strategic sites under PMO Surigao's Area of Operations (AOR).

The Port Management Office of Surigao hosts a number of private mining ports in the Provinces of Surigao del Norte, Surigao del Sur and Dinagat Islands. Most, if not all, of these private ports are located at a considerable distance from the PPA's terminal management offices in the areas where these ports are located. Furthermore, mineral products for exports are mostly loaded at anchorage. Information on the number of days required to compute port usage is solely provided by the shipping agency because manpower constraints prevent us from physically verifying whatever claims (as to port stay) made by the shipping agent. Now with our connection to the marinetraffic.com AIS network, the PMO now has a "foolproof" method to determine a vessel's actual entrance and departure based on the ship's movements as tracked by the AIS.

Solution and Impact:

With the lack of manpower to make verifications as to port stays of vessels doing loading operations on anchorage, ensuring that correct port charges (which corresponds to actual port stays) are collected has always been a challenge. The PMO has left with no recourse but to accept whatever claims made by shipping agents.

With the establishment of an AIS Station at the Port of Surigao, PMO Surigao had it connected to marinetraffic.com, a global network of AIS stations. Among the features offered by the web portal is the availability of having access to its database of track movements for sixty days. It may be informed that marinetraffic.com logs in a vessel's track and stores it in its database as voyage history. With access to marinetraffic.com's 'voyage history' database, the PMO has gained a reliable tool in determining a vessel's actual port stay – from entrance to departure – and collect the correct port charges. It bears pointing out that a day's port charges amount to around P50,000 to 70,000 hence ensuring that correct charges are levied makes a lot of difference.

Abbreviation and Terminologies:

AIS – Automatic Identification System

PPA – Philippine Ports Authority

PMO – Port Management Office

MARINA – Maritime Industry Authority

AtoN – Aid to Navigation

VTMS – Vessel Traffic Management System

TMO – Terminal Management Office

NOA – Notice of Arrival

II. DETAILS OF THE DATA COLLABORATION PROJECT:

Extent the Data Collaboration Project is Applied to fulfill the organization's mandate

Applying this practice facilitate, if not ensure, that correct port charges are collected. It has led to better collection efficiency which translates to increased revenue that benefits not just the organization but the general public who uses the Philippine port system for transportation, trade and commerce.

Maintaining an AIS station also fulfills our mandate to foster safe navigation by monitoring harbor traffic with the end view of making it safer and making it available during search and rescue operations for partner agencies such as the Philippine Coast Guard and the Maritime Industry Authority.

The use of AIS as an AtoN can provide the following services to AIS equipped vessels:

- Provide identification of the AtoN in all weather conditions such as buoys, major floating aids;
- Complement existing signals from AtoN (e.g. AIS equipped lighthouse);
- Transmit accurate positions of floating AtoN;
- Provide weather, tidal, and sea state data

In addition, PPA ports at the Pacific Seaboard, may function as a 'Port of Refuge' during extreme weather and can guide AIS-tracked vessels in seeking shelter.

With the installation of AIS, the Port of Surigao is now capable of identifying specific vessels and their activity within or near the nation's exclusive economic zone/territorial jurisdiction. For ports on the critical border areas, such as government ports in Mindanao's Pacific (eastern) seaboard, AIS can be

utilized for surveillance and monitoring security situations.

Describe the regularity by which the practice is used

The practice is used every time a shipping agent request for assessment of port charges to settle, the claims as port stays indicated in the dockage report submitted is verified in the marinetraffic.com database. The verifications made in the database is used as basis in the computation of port charges. Daily monitoring of harbor ship traffic is done.

Aside from remotely monitoring port stays of vessels with offshore loading operations, the PMO also utilizes the system in monitoring foreign vessels already in the PMO's area of responsibility, as well as those who are yet to arrive at the destination port in the PMO's AOR. As the vessel files a Notice of Arrival (NOA), the operations officer on duty takes note of its Estimated Time of Arrival and other information such as the ship's Length Over-all (LOA), Gross Tonnage and other relevant information/ship particulars supplied automatically by marinetraffic.com. With these, the PMO can do advance planning is better prepared to receive an arriving ship.

Describe the consistency by which the practice is being used by target users

The practice is mainly used by PPA Harbor Operations Officers and Vessel Assessment personnel. As to stakeholders/beneficiaries, shipping operators are better served through better berth assignments and correct assessments of port dues levied on them.

The Universal Shipborne Automatic Identification System (AIS) is a vessel tracking system capable of communicating navigation information automatically between AIS equipped vessels and coastal authorities (such as PPA Surigao which maintains a coastal/land based AIS Station). Vessels equipped with a receiver can also benefit by knowing the whereabouts and intentions of these ships. AIS provides a tool for improved safety and collision avoidance.

By connecting the Port of Surigao's AIS station to marinetraffic.com, it gained the capability to track the real time position of any vessel tracked by any AIS station (registered at marinetraffic.com.) To date, the Surigao station is a registered marinetraffic.com receiver (ID no. 1228). To illustrate, a vessel carrying heavy equipment from China destined for Surigao can be tracked during the berthing meeting a day before her arrival. With AIS, one can know her exact position, arrival draft, cargo contents, etc. Harbor Pilots can also benefit from advance information through AIA. Yet this feature can only be availed through subscription with marinetraffic.com

Aside from the applications described, another salient feature in maritimetraffic.com which may further improve the PMO's collection efficiency is the option to avail of a tracked vessel's "Voyage History." The PRO Plan gives subscribers the privilege of accessing a tracked vessel's movements for 60 days. With no operations officers monitoring foreign loading ore on anchorage at private ports,

there is no foolproof way to determine vessel stay and/or movements which are bases for the computation of port charges.

BASELINE DATA

In 2016, a year after the AIS remote monitoring of vessel port stays, total income of PMO Surigao exceeded half a billion pesos for the first time since the PMO was established in 1977. With a slight dip in 2017, the PMO managed to maintain its half-billion income status in 2018 and 2019. It may be argued that since around 80% of the PMO's annual income are derived from revenues collected from private ports operations, the verifications made using the AIS/marinetraffic.com system contributed much to increased/improved collection efficiency.

Discuss the improvements in your target by comparing the results

Since the primary impact of the practice rest upon revenue performance, the PMO has its target revenue in 2016 and 2018, while barely missing the assigned targets for 2017 and 2019. Considering that target figures are assigned/determined by Head Office and increased by around 5 to 7%, meeting the assigned target is a tremendous challenge.

Discuss how this practice contribute in the productivity of the organization

The practice is a great boon in increasing/improving collection efficiency which translates to income growth that benefits the government's fiscal position. For the PMO's port charges assessment personnel, the AIS system provides them a useful tool in ensuring that correct port charges are collected.

On the other hand, the PMO's operations personnel also benefit from having a reliable, efficient tool in remotely monitoring private ports operations by having online access to AIS data.

Identify the impact of the practice

The PMO uses AIS to monitor traffic within its area of responsibility. But millions of users rely on maritime tracking intelligence providers, like MarineTraffic and its competitors, to provide them with a global picture. Online access to AIS data allows port authorities to monitor vessel operations of ships at ports under its jurisdiction. On the other hand, vessel operators can use AIS data to monitor and manage their fleets, suppliers and service providers to find new business, and crew members to be tracked by family and friends.

Processed AIS data can provide insights and information to a wide range of maritime professionals, from port authority managers, analysts, insurers, researchers and other regulatory bodies.

Comparison with other systems as practiced in other ports of the PPA

The use of AIS as supplement to Radar Systems in Vessel Traffic Managements Systems (VTMS) are widely applied in the PPA's large, gateway ports such as the Port of Manila and Port of Batangas But as far as this PMO knows, applying AIS data to remotely monitor vessel port stays as bases in the computation/assessment of port charges is first applied in the Port of Surigao. Although a number of technical personnel from other PMO's made inquiries (and some actually came to physically observe how the system works), we cannot say for sure, nor describe the extent as to how it is applied elsewhere.

Presently, the use of online AIS data (from marinetraffic.com) and as aid to navigation is only known within the PPA organization and its network of shipping agents and port users. The practice was not formally publicized.

Sustainability and Next Steps

PMO Surigao is planning to add more AIS shore-based stations at the Port of Dapa in Siargao Islands and the Port of Hayanggabon in Claver, Surigao del Norte. Incidentally, Port of Hayanggabon is situated right in the middle of the Claver-Carrascal Mining Corridor, an area that hosts a number of shipping ports catering to the mining industry in the provinces of Surigao del Norte and Surigao del Sur.

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