

Protecting your assets in the maritime environment

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Jason Tieman, Oceaneering Director of Maritime Solutions GDS/PortVision explains why protecting your assets in the maritime environment should be a top priority.

Oil and gas companies must optimise operational efficiency in an increasingly challenging environment, while paying close attention to safety and security. Because vessel traffic can affect the safety and security of their infrastructure, owners of remotely owned assets in the maritime environment are increasingly taking a more proactive role in monitoring and responding to perceived threats. When a vessel comes in contact with pipelines and other fixed infrastructure, the consequences can range from unplanned and expensive surveys and repairs, as well as major waterway closures resulting in third party claims. It also can cause significant environmental impact leading to a costly response and penalties, and in some cases may lead to injury and death. All of these consequences can result in reputational damage and lengthy post-incident



2013 settoon incident - photo courtesy of the USCG

litigation. Automatic Identification System (AIS) data is extremely valuable for threat assessment and mitigation planning. Its use for collision avoidance was born out of a 2005 International Maritime Organisation (IMO) and U.S. Coast Guard mandate that most commercial vessels must continuously transmit AIS signals throughout global ports and inland waterways. Since then, AIS data has been used to develop numerous tools and solutions by all major oil companies as



A buoy ATON transmitting navigational information - photo courtesy of the USCG, 5th District

well as marine service providers, vessel operators and government agencies as an inexpensive way to better understand vessel movements globally. These solutions increase visibility to real-time and historical commercial vessel traffic, and include activity-logging, process management, business analysis and reporting tools to provide a single operational dashboard that improves the productivity, safety and efficiency of multiple assets and/or fleets. The United States Coast Guard is very clear about the responsibility vessel operators bear in preventing collisions, including maintaining proper look-out procedures and using all available means appropriate to the prevailing circumstances and conditions to determine if risk of collision exists, but what about operators that maintain infrastructure in the maritime environment? The technology now exists for owners and operators of fixed marine infrastructure to play a key role in the prevention of an incident, as well. They can actively collaborate with vessel operators on collision avoidance by using analytical tools to assess AIS vessel position data and/or radar information. These solutions can be used to not only pre-empt strikes before they occur, but to also achieve a more complete vulnerability picture to improved risk mitigation strategies. The first use of AIS as a method to communicate safety information

directly to a vessel for marine asset protection was for a pipeline monitoring program launched in August 2015 by the Coastal and Marine Operators (CAMO) group in partnership with the Greater LaFourche Port Commission and Oceaneering. The CAMO initiative uses Oceaneering's PortVision AIS-based vessel-monitoring service to monitor and automatically alert vessel operators that might be slowing, stopping, or anchoring inside two NOAA charted pipeline corridors north and south of Port Fourchon that pass under its main navigable channel. This concept was made possible by deploying an AIS Aid to Navigation (ATON). These AIS ATONs can be associated with a real ATON that is physically in the water or can be virtual, and are capable of transmitting safety messages. Because AIS provides the ability to send messages to the unique MMSID assigned to the vessel's AIS transponder, a vessel that is maneuvering inside a monitored corridor in a way that could lead to a threat to the pipeline will trigger the transmission of an alert message only to the wheelhouse of the encroaching vessel, warning its captain and crew of the pipeline below. CAMO, in partnership with the Port Fourchon, was the first to use AIS ATONs in this way and has been very pleased with the enhanced level of awareness it has brought to vessels that sometimes loiter in these corridors. Any



CAMO's and PortFourchon's AIS safety signal alert was the first of its kind to be transmitted directly to a vessel's warehouse

oil platforms are a great example of remote assets that usually already have a radar that can be combined with the AIS information for an enhanced web-based vessel-monitoring solution. Radar data is extracted at its source and converted into a National Marine Electronics Association (NMEA) format that can be processed jointly with AIS vessel data into a live display. All unidentified targets can then be monitored and displayed along with AIS data without repetitive or overlapping data. This combined data feed allows the existing tools to monitor for any encroachment that represents a threat to the asset, and trigger the necessary alert. It similarly can be archived for retrieval to provide playback for historical information and reporting. Oil companies and owners of fixed assets in the maritime environment are exposed to hundreds of vessels crossing and operating near their pipelines or infrastructure daily.

organisation can apply for an AIS ATON for their pipeline or other fixed asset by simply going through an application process with the U.S. Coast Guard. At the same time that alerts were being targeted at specific vessels in these two Port Fourchon pipeline corridors, pipeline operators recognised they could be monitoring their entire submerged pipeline infrastructure for vessel activity. This gave their staff the ability to proactively investigate vessel activity that appeared to be a threat, based on triggered alerts to their pipeline monitoring team. Historically, pipeline operators would only be aware of vessel activity around their pipelines when they conducted an overflight every few weeks, or after there was already an impact. This proactive monitoring by pipeline companies has already resulted in multiple positive communications with vessels detected near a pipeline, which otherwise might have resulted in a marine casualty. The way pipeline operators use AIS data continues to evolve. For the first time, pipeline companies are able to truly assess the amount of vessel traffic that is transiting over their pipelines and, in many cases, they have uncovered high-risk pipeline segments that were previously believed to have minimal or no vessel traffic. By developing a risk matrix based on the pipelines' depth of cover, amount of vessel traffic, as well as information about vessel type and draft of the passing vessels, pipeline operators can greatly improve their risk assessments and better target how maintenance funds should be spent. Additionally, these companies spend thousands of dollars on outreach campaigns

Pipeline maps are incorporated into the vessel-tracking tool and alerting parameters and criteria are developed and built in to the asset protection solution

that are sometimes focused on the wrong audience. By assessing the historical vessel traffic that interacts near their infrastructure, they can target their messaging not only to a specific type of vessel, but can actually target specific vessels or fleet owners that represent a consistent concern for their infrastructure.

Adding radar data

In addition to AIS, it is important to consider incorporating other data sources, such as radar, into asset-monitoring solutions. This provides a more complete picture of all vessels moving around marine infrastructure and ensures that even vessels that are not transmitting AIS signals can be monitored to determine if they appear to pose a threat. While the vessel can't be alerted via AIS ATONs, they can at least be included in the traffic picture and monitoring tools. Offshore

With an ongoing threat to the safe and secure operation of these assets, along with the available technology to combat these threats, how can an operator not consolidate the real-time visibility of all their assets into one system that not only allows them to take preventive steps as they are alerted of a threat, but can also replay or report on five years of these vessel interactions? Finally, asset-protection tools and services also can play a key role in improving policy and regulatory compliance. Any investigation of a maritime collision generally includes assessing a vessel's use of "all available means" to "determine if a risk of collision exists." At some point, incident investigators may ask operators of fixed assets a similar question: Are you using all the resources available to effectively monitor the safety of your assets and the environment in which you operate? 