

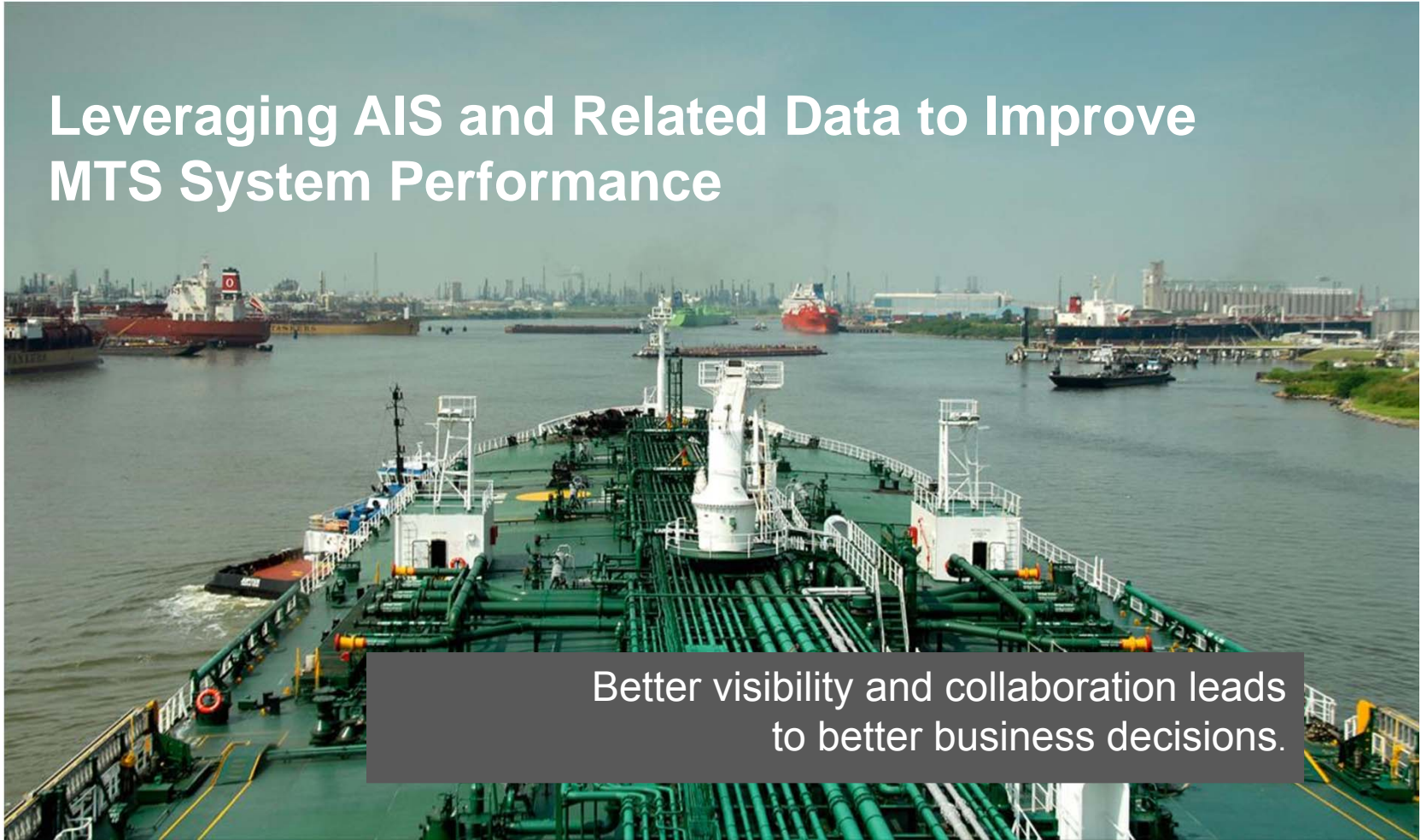


Oceaneering International Inc.



3rd Biennial Research & Development Conference:
Innovative Technologies for a Resilient Marine Transportation System

Leveraging AIS and Related Data to Improve MTS System Performance



Better visibility and collaboration leads
to better business decisions.



PortVision/Oceaneering International Inc.

- Founded in 1995 by AIRSIS
- Core competence in software development and remote asset management
- Technology solutions in energy and transportation
 - Vessel tracking/fleet management
 - Port/terminal optimization
 - Maritime data analysis
 - Supply chain logistics
 - Combine terrestrial, cellular, and satellite data
 - Custom Solutions
- Launched PortVision, a division of AIRSIS in 2006
 - 2011 Plimsoll Award Recipient
 - PortVision Patent: April 2011
(System and method for harvesting business intelligence from maritime communications)
- Merged with Oceaneering® - June 1, 2014



What is AIS

- Automatic Identification System (AIS) implemented world wide since 2005
 - Collision avoidance transponder
 - Mandated by USCG and IMO on vessels over 300 gross tons (65 feet in US)
 - Proposed expanded regulations to include smaller commercial/passenger vessels
- Primary purpose was collision-avoidance at sea – now uses have expanded to homeland security, shore-side logistics, etc.



Automatic Identification System



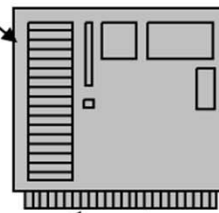
**AIS Collision
Avoidance Signals**



**Maps and Aerial
Views of Waterways**



**Computing infrastructure for
data processing, data warehousing
application and web presentation**



Network of PortVision receivers



Marine Transportation System Challenges

- Effective planning based on information from others
- Forecasting vessel ETA's
- Responding to changes (weather, schedule, etc.)
- Communicating with others (internal and external)
- Managing vendors and service providers
- Minimizing delay, dock idle time, and demurrage
- Management reporting
- Compliance / audits



Who Uses AIS

AIS users include...

- Every major oil company
- Marine transportation companies
- Harbor tugs
- Marine service providers; agents, inspectors, line handlers
- Port Authorities, marine organizations (GICA, WGMA, CAMO)
- Government users –Local/State/Federal (BOEMRE, USACE, DHS, MARAD, USCG, NOAA)
- Legal/US Federal Court (accepts AIS data as fact)



How AIS Can Be Leveraged

- Mapping of real-time vessel locations
- Automatic logging of arrivals, departures, and passings
- E-mail/text message alerts
- Flexible searching and filtering
- Business Intelligence
- Historical playback and reporting
- Web-based to support remote access



Real-time Vessel Intelligence

- Fleet Tracking
- Vessel Details
- Zones & Alerts
- Weather
- Vessel Events

The screenshot shows the Portvision software interface. At the top, there is a search bar and a region dropdown set to "New Orleans, Louisiana". Below the search bar is a map of a waterway with several vessel icons. A filter panel is open, showing options for "Fleets" (Alliance, Fleet 2, Melissa, My Vessels, All My Fleets) and "Views" (Containers only View, View A). The details sidebar on the right shows information for vessel "NITAE", including its type, call sign, IMO number, flag, last report, heading, speed, and location. It also lists recent events and actions.

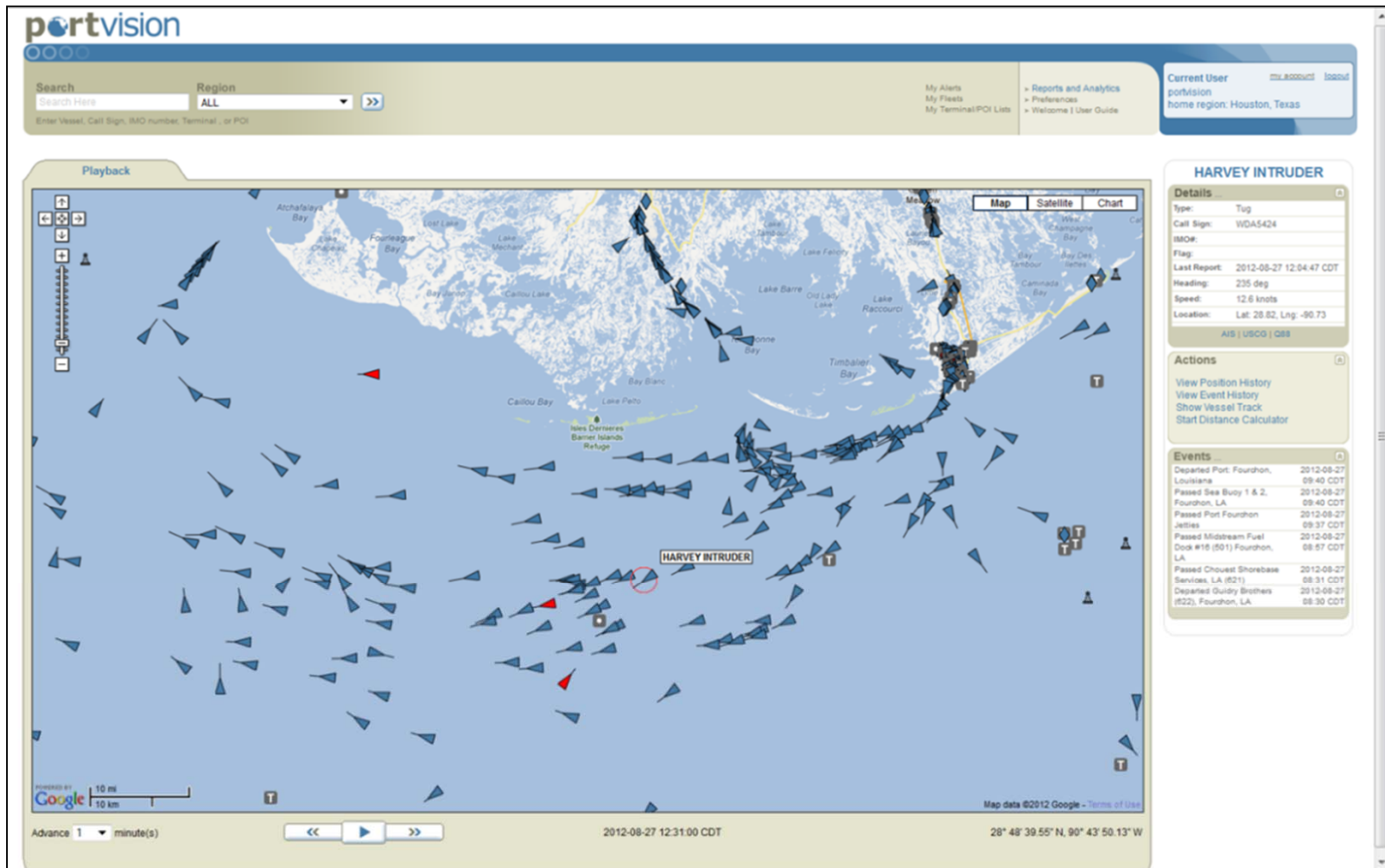
Details	
Type:	Unknown
Call Sign:	WTH5009
IMO#:	1048576
Flag:	Unknown
Last Report:	2 minutes ago 2012-11-30 16:09:54 CST
Heading:	73.1 deg
Speed:	6.6 knots
Location:	0.19 miles SE of Greensport, Houston, TX Lat: 29.74, Lng: -95.19
Data Source:	AIS:GandH
Details AIS USCG Q88	

Events	
Passed KinderMorgan	2012-11-30 18:00 CST
Passed Houston Cement, Houston, TX	2012-11-30 15:52 CST
Passed Kinder Morgan Galena Park, TX 4	2012-11-30 15:51 CST
Passed Lyondell/Houston, TX Refining D Dock	2012-11-30 15:44 CST
Passed Old Manchester	2012-11-30 15:28 CST
Passed 610 Bridge, Houston TX	2012-11-30 15:25 CST
View More	

Actions	
View Details	
Create Alert	
Record Event	
Schedule this Vessel	
Show Vessel Track	
Start Distance Calculator	
Fleets	
Follow Vessel	



Vessels Leaving Before the Storm....





Gulf Intracoastal Canal Association (GICA)

portvision
GICA Waterway Alerts

Current Alerts as of 2014-06-19 16:55 CDT

GICA NAV ALERT - UPDATE - Grosse Tete Bridge Repair Work - Port Allen Route - Repairs Suspended, PAR Open to Navigation 11-22 June

Due to recent rise and high currents, repair work on timbers at the Grosse Tete Bridge has been suspended for two weeks. The bridge will be open to navigation per normal operating regulations starting 11 June and running through 22 June.

Repair work will resume on Monday, 23 June and the bridge will be closed to navigation each weekday 0600 to 1700 until repairs complete in mid July.

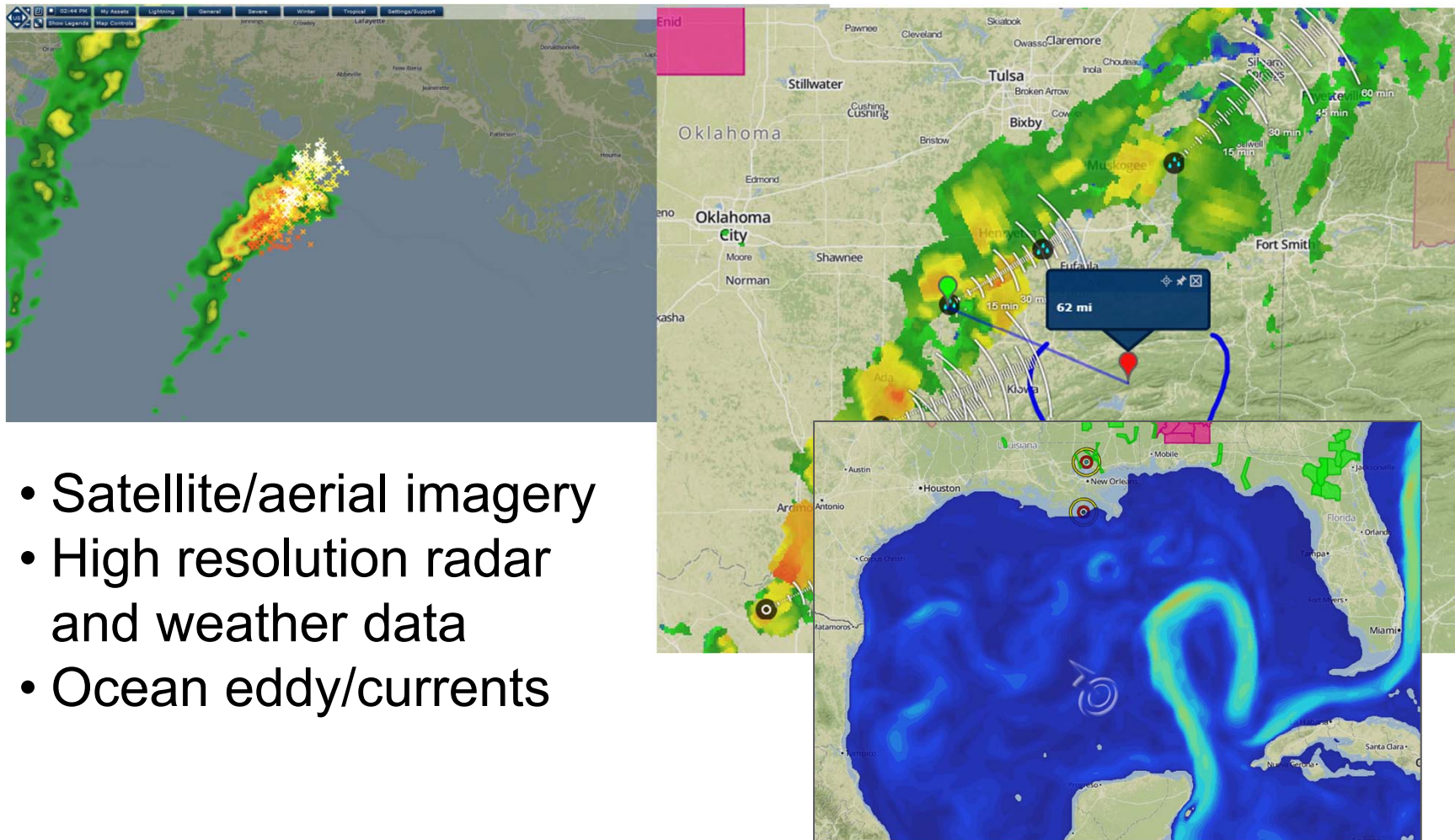
Source: GICA From: 2014-06-10 00:00 CDT

Type	Waterway Alert	From	To
	GICA NAV ALERT - Caney Creek Swing Bridge, TX - GIWW MM 418 WHL - Barge Allides with Bridge - Tows Restricted to single Wide - 15 June	2014-06-15 00:00 CDT	2014-06-21 00:00 CDT
	GICA NAV ALERT - UPDATE - Grosse Tete Bridge Repair Work - Port Allen Route - Repairs Suspended, PAR Open to Navigation 11-22 June	2014-06-10 00:00 CDT	2014-06-23 00:00 CDT
	GICA NAV ALERT - UPDATE - Houma Navigation Canal Bridge, LA - Closures for Repair Work - USCG Safety Zone - 2 June 2014	2014-06-02 00:00 CDT	2014-07-07 00:00 CDT
	GICA NAV ALERT - UPDATE - Temporary Reroute of GIWW in Mobile Bay, AL - 16 June to about 30 July 2014	2014-06-02 00:00 CDT	2014-07-30 00:00 CDT

gica.portvision.com



Weather



- Satellite/aerial imagery
- High resolution radar and weather data
- Ocean eddy/currents



Improve Safety & Incident Response

- Visibility of response assets
- Improved safety
- Optimized accountability of contracted assets
- Remotely monitor impacted zones
- Monitoring vessels not evolved in the response
- Validate third party claims





Deepwater Horizon

portvision

Search Region **Baton Rouge, Louisiana**

My Alerts | My Fleets | My Terminal/POI Lists | [Reports and Analytics](#) | [Preferences](#) | [Welcome | User Guide](#)

Current User: [my account](#) | [logout](#)
 portvision
 home region: Houston, Texas

Enter Vessel, Call Sign, IMO number, Terminal, or POI

Full Screen | Filters | Show Weather | Map | Satellite | Chart

Fleets	Maintain Fleets	Views	Maintain Views
CGC Fleet	<input type="checkbox"/>	6m Plus Draft	<input type="checkbox"/>
July vessels	<input type="checkbox"/>	Dredges	<input type="checkbox"/>
Lift Boat Fleet	<input type="checkbox"/>	Houston	<input type="checkbox"/>
LMTO	<input type="checkbox"/>	kjgh	<input type="checkbox"/>
My Vessels	<input checked="" type="checkbox"/>	Large Vessels	<input type="checkbox"/>

[Remove Filters/Show All Vessels](#)

Map data ©2012 Google, INEGI - Terms of Use

CREOLE.CRUSADER

Details

Type:	Unknown
Call Sign:	WDC3291
Flag:	United States
Last Report:	55 seconds ago 2012-05-01 18:39 CDT
Heading:	Unknown
Speed:	0 knots
Location:	0.69 miles E of GIWW MM 50 W Lat: 29.58, Lng: -90.60
Data Source:	AIS

[Details](#) | [AIS](#) | [USCG](#) | [Q88](#)

Events

Departed Port: New Orleans, Louisiana	2012-05-01 07:36 CDT
Passed GIWW MM 40 W	2012-05-01 07:29 CDT
Passed GIWW MM 30 W	2012-05-01 06:09 CDT
Passed GIWW MM 20 W	2012-05-01 04:48 CDT
Passed GIWW MM 10 W	2012-05-01 03:13 CDT
Passed Belle Chasse HWY, LA	2012-05-01 01:44 CDT

[View More](#)

Actions

- [View Details](#)
- [Create Alert](#)
- [Record Event](#)
- [Show Vessel Track](#)
- [Start Distance Calculator](#)
- [Fleets](#)
- [Follow Vessel](#)

CURRENT FILTER: My Vessels



USACE Colorado/Brazos River Flood Gates



- Needed better visibility of vessels approaching /interacting with the flood gates
- Historical data used to validate placement of new mooring buoys.



Historical

portvision Vessel Position Report

Vessel: From Date/Time: Interval:

Time Zone: Local GMT To Date/Time:

1 of 2 Select a format Export

portvision Vessel Position Report

Position records for MISS SUSAN - Call sign: WDC2611 beginning 2014-03-22 11:45:00

Position Date	Position Time	Position Label	Speed	True Heading
2014-03-22	11:45:13 CDT	0.45 miles SE of Sterling TC Dock 4	4.5 knots	N/A
2014-03-22	11:46:02 CDT	0.51 miles E of Sterling TC Dock 4	4.7 knots	N/A
2014-03-22	11:46:44 CDT	0.56 miles E of Sterling TC Dock 4	5 knots	N/A
2014-03-22	11:47:32 CDT	0.63 miles E of Sterling TC Dock 4	5.3 knots	N/A
2014-03-22	11:48:13 CDT	0.69 miles E of Sterling TC Dock 4	5.3 knots	N/A
2014-03-22	11:49:02 CDT	0.77 miles E of Sterling TC Dock 4	5.5 knots	N/A
2014-03-22	11:49:43 CDT	0.83 miles E of Sterling TC Dock 4	5.6 knots	N/A
2014-03-22	11:50:32 CDT	0.9 miles E of Sterling TC Dock 4	5.6 knots	N/A
2014-03-22	11:51:13 CDT	0.97 miles E of Sterling TC Dock 5	5.7 knots	N/A

- Six years of data
- Vessel & Fleet Reports
- Port & Zone Reports
- Terminal & Point of Interest Reports
- Playback

portvision

Search: Region:

My Alerts My Fleets My Terminal/POI Lists

Reports and Analytics Dashboard Preferences Welcome | User Guide

Current User: [my account](#) [logout](#)
portvision
home region: Port of Galveston, Texas

MISS SUSAN

Details

Type: Vessel
Call Sign: WDC2611
Flag: United States
Last Report: 89 days 4 hours ago
2014-03-22 12:35:43 CDT
Heading: 318.6 deg
Speed: 4.4 knots
Location: Lat 29.37, Lng -94.80
AIS | USCO | Q88

Actions

View Position History
View Event History
Hide Vessel Track
Start Distance Calculator

Events

Passed HSC Lightbuoys 31/32_Galveston_TX	2014-03-22 12:35 CDT
Passed Texas City Dike	2014-03-22 12:20 CDT
Departed Port: Texas City, Texas	2014-03-22 11:43 CDT
Passed NuStar Energy LP, Texas City Terminal 1, TX	2014-03-22 11:33 CDT
Departed NuStar TC Dock 19	2014-03-22 11:29 CDT
Arrived NuStar TC Dock 19	2014-03-22 06:08 CDT

Playback

Advance 1 minute(s) 2014-03-22 12:36 CDT



Reporting-Vessel Event

portvision Vessel Event Report

Vessel From Date/Time

Time Zone Local GMT To Date/Time

1 of 1 Select a format Export

portvision **Vessel Event Report** www.portvision.com
(713) 337-3737
info@portvision.com

Position records for MARAN ATLAS - Call sign: SVAQ7 beginning 2013-03-11 00:00 ending 2013-03-19 17:09 in local time

Position Time	Position Label	Event Name	Speed Over Ground	Heading	Latitude	Longitude
2013-03-11 06:35 CDT	At Southwest Pass Entrance	Passed Southwest Pass Entrance	8.8 knots	034 [NE]	28.92890	-89.41262
2013-03-11 07:34 CDT	At EPL East Bay	Passed EPL East Bay	8.9 knots	037 [NE]	29.05707	-89.31245
2013-03-11 07:37 CDT	At EPL East Bay	Arrived at Port. Venice, Louisiana	8.9 knots	040 [NE]	29.06320	-89.30677
2013-03-11 08:14 CDT	At MISSISSIPPI MM 0	Passed MISSISSIPPI MM 0	8.4 knots	005 [N]	29.14070	-89.25592
2013-03-11 08:23 CDT	At Head of Passes-Lwr Mis.	Passed Head of Passes-Lwr Mis.	9.1 knots	348 [N]	29.16240	-89.25555
2013-03-11 08:25 CDT	At Pilottown	Passed Pilottown	9 knots	345 [N]	29.16818	-89.25727
2013-03-11 08:48 CDT	At MISSISSIPPI MM 5	Passed MISSISSIPPI MM 5	9.1 knots	327 [NW]	29.21855	-89.28507
2013-03-11 08:56 CDT	At Pilottown Anchorage, LA	Passed Pilottown Anchorage, LA	9.4 knots	318 [NW]	29.23555	-89.30030
2013-03-11 09:14 CDT	At MISSISSIPPI MM 10	Passed MISSISSIPPI MM 10	9.1 knots	315 [NW]	29.26683	-89.34002
2013-03-11 09:18 CDT	At Upper Venice Anchorage, LA	Passed Upper Venice Anchorage, LA	9.2 knots	328 [NW]	29.27402	-89.34735
2013-03-11 10:10 CDT	At MISSISSIPPI MM 20	Passed MISSISSIPPI MM 20	8.6 knots	243 [SW]	29.36247	-89.45348
2013-03-11 10:14 CDT	At MISSISSIPPI MM 20	Departed Port: Venice, Louisiana	9 knots	229 [SW]	29.36652	-89.46235
2013-03-11 11:06 CDT	At MISSISSIPPI MM 30	Passed MISSISSIPPI MM 30	9.8 knots	323 [NW]	29.39472	-89.59598
2013-03-11 12:09 CDT	1.11 miles NW of MISSISSIPPI MM 40	Arrived at Port: New Orleans, Louisiana	9.7 knots	333 [NW]	29.50288	-89.70542
2013-03-11 12:54 CDT	At MISSISSIPPI MM 50	Passed MISSISSIPPI MM 50	9.8 knots	309 [NW]	29.58167	-89.80808
2013-03-11 13:15 CDT	At United Bulk Terminal, Davant, LA	Passed United Bulk Terminal, Davant, LA	9.7 knots	283 [W]	29.60445	-89.86573
2013-03-11 13:48 CDT	At MISSISSIPPI MM 60	Passed MISSISSIPPI MM 60	9.4 knots	342 [N]	29.65060	-89.95447
2013-03-11 14:52 CDT	At MISSISSIPPI MM 70	Passed MISSISSIPPI MM 70	3.2 knots	013 [N]	29.77648	-90.02335
2013-03-11 14:54 CDT	At Cedar Grove Anchorage, LA	Passed Cedar Grove Anchorage, LA	2.8 knots	019 [N]	29.77785	-90.02317
2013-03-11 15:09 CDT	At Cedar Grove Anchorage, LA	Arrived Cedar Grove Anchorage, LA	0.4 knots	009 [N]	29.78092	-90.02168
2013-03-14 12:53 CDT	0.11 miles NW of MISSISSIPPI MM 70	Departed Cedar Grove Anchorage, LA	0.3 knots	024 [NE]	29.77972	-90.02207
2013-03-14 13:37 CDT	At Belle Chase Ferry	Passed Belle Chase Ferry	9.5 knots	008 [N]	29.85473	-89.97797
2013-03-14 13:59 CDT	At MISSISSIPPI MM 80	Passed MISSISSIPPI MM 80	9.8 knots	121 [SE]	29.87067	-89.93808
2013-03-14 15:25 CDT	At ExxonMobil Chalmette Dock 4, LA (MM 88.4)	Arrived ExxonMobil Chalmette Dock 4, LA (MM 88.4)	0.4 knots	300 [NW]	29.92845	-89.97653

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Reporting-Terminal Detail

www.portvision.com
(713) 537-3737
info@portvision.com

Terminal / POI Detail Report

Arrivals and departures from Chalmette Terminals, LA -- New Orleans, Louisiana beginning 2013-01-14 ending 2013-01-25 in local time

Vessel Name	Type	Arrived	Departed	Hours	Origin	Next Destination
COUNT FLEET	Tug	2013-01-14 18:25 CST	2013-01-14 19:30 CST	0.08	Meraux Bouys, LA	Meraux Bouys, LA
SAFETY PRIDE	Vessel	2013-01-15 06:07 CST	2013-01-15 06:16 CST	0.13	New Orleans Quarantine Anchorage, LA	New Orleans Quarantine Anchorage, LA
OMAHA	Vessel	2013-01-15 07:39 CST	2013-01-15 07:44 CST	0.08	ExxonMobil Chalmette Dock 4, LA (MM SE 4)	Meraux Bouys, LA
MISS KAITLYN	Vessel	2013-01-16 02:05 CST	2013-01-16 02:18 CST	0.22	New Orleans Quarantine Anchorage, LA	New Orleans Quarantine Anchorage, LA
COUNT FLEET	Tug	2013-01-17 12:10 CST	2013-01-17 12:15 CST	0.1	Meraux Bouys, LA	Meraux Bouys, LA
OMAHA	Vessel	2013-01-18 01:46 CST	2013-01-18 01:56 CST	0.15	Amstar Terminal, New Orleans, LA	Chalmette Slip, New Orleans, LA
OMAHA	Vessel	2013-01-18 13:30 CST	2013-01-18 13:48 CST	0.3	Amstar Terminal, New Orleans, LA	Meraux Bouys, LA
MIRIAM W COOPER	Tug	2013-01-20 10:53 CST	2013-01-20 11:49 CST	0.93	New Orleans Quarantine Anchorage, LA	Crescent Towing, New Orleans, LA
ONEGO TRADER	Cargo	2013-01-20 10:56 CST	2013-01-23 16:31 CST	77.57	New Orleans Quarantine Anchorage, LA	N/A
GORDON V. SR.	Vessel	2013-01-20 23:38 CST	2013-01-20 23:49 CST	0.18	Chalmette Bouys, New Orleans, LA	New Orleans Quarantine Anchorage, LA
JENNIFER	Tug	2013-01-22 04:02 CST	2013-01-22 04:41 CST	0.65	Chalmette Bouys, New Orleans, LA	Chalmette Bouys, New Orleans, LA
GORDON V. SR.	Vessel	2013-01-22 04:55 CST	2013-01-22 05:04 CST	0.15	Chalmette Bouys, New Orleans, LA	Chalmette Bouys, New Orleans, LA
SAFETY PRIDE	Vessel	2013-01-23 11:53 CST	2013-01-23 12:00 CST	0.12	New Orleans Quarantine Anchorage, LA	New Orleans Quarantine Anchorage, LA
GORDON V. SR.	Vessel	2013-01-23 12:59 CST	2013-01-23 13:53 CST	0.9	New Orleans Quarantine Anchorage, LA	Chalmette Slip, New Orleans, LA
MIRIAM W COOPER	Tug	2013-01-23 16:13 CST	2013-01-23 16:30 CST	0.27	Crescent Towing, New Orleans, LA	Stothaven 3 New Orleans
GORDON V. SR.	Vessel	2013-01-24 06:28 CST	2013-01-24 08:34 CST	0.1	New Orleans Quarantine Anchorage, LA	Chalmette Slip, New Orleans, LA
MISS KAITLYN	Vessel	2013-01-24 10:43 CST	2013-01-24 10:53 CST	0.15	New Orleans Quarantine Anchorage, LA	New Orleans Quarantine Anchorage, LA



Study Traffic Patterns

Some vessels who were in the port a few hours could be missed for harbor fee assessment.

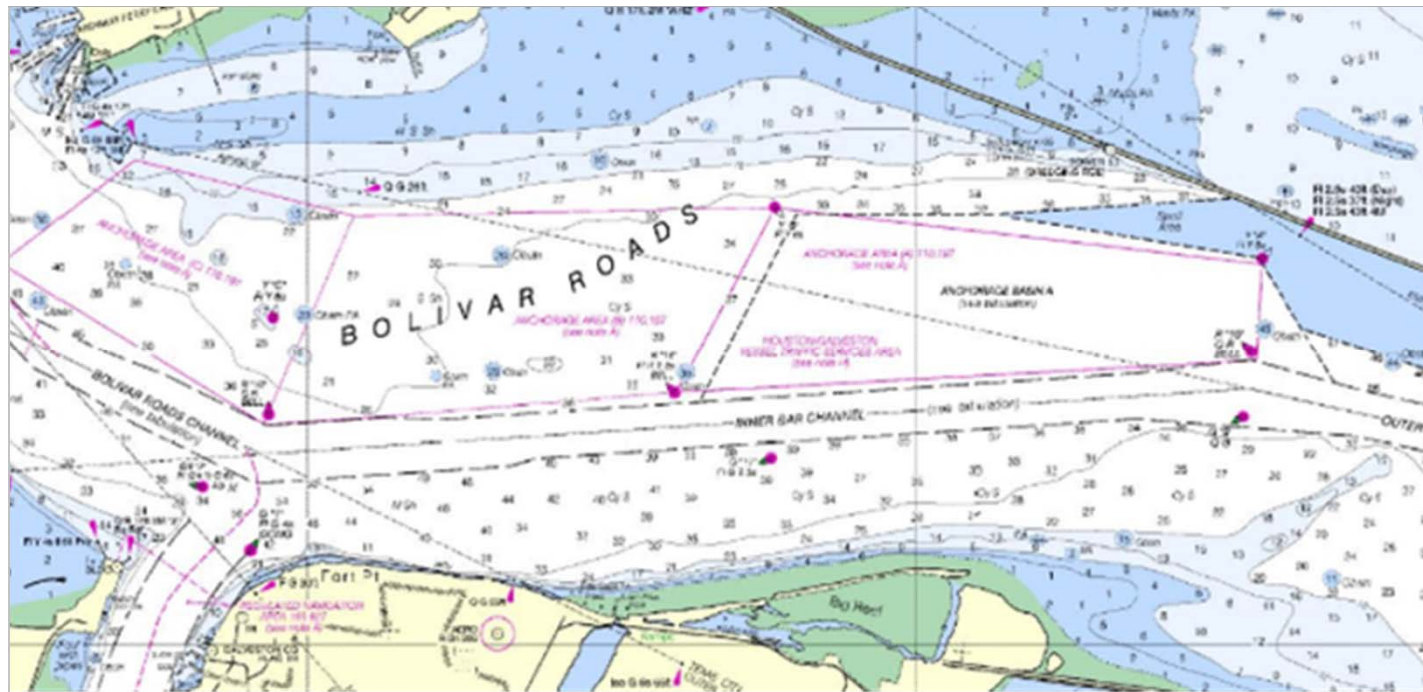
By using AIS data, it enabled PONO to create reports that showed :

- All AIS-enabled vessels
- Passing points
- Times of arrival /departures
- Length of dockings





Houston Galveston Harbor Safety Committee



- Needed to optimized anchorage utilization
- Better data for historical information and analytics
- Improved safety and usage of anchorage areas



Offshore Traffic Studies

- BOEM: used AIS data to study offshore emissions from service vessels
- Windfarms: looked at traffic patterns to validate placement of proposed wind farm
- Vessel compliance to charter contracts





Port of Morgan City

- POMC needed a system to increase visibility of vessels operating in the port at public and private docks.
- Leveraged AIS data to help supplement tonnage data to increase dredging funds and improve ranking in the USACE NDC Waterborne Commerce Statistics Fact Card.





Port of New Orleans

Collection of Tariffs

Some vessels who were in the port a few hours could be missed for harbor fee assessment.

By using AIS data, it enabled PONO to create reports that showed :

- All AIS-enabled vessels
- Passing points
- Times of arrival/departures
- Length of dockings.



On the average/month PONO now captures with AIS data, harbor fees for an additional 145 vessels/month that may have been missed.



Coastal & Marine Operators (CAMO) Pipeline Industry Initiative

AIS Notification System for pipelines in the Port Fourchon area

- Each vessel passing through these pipeline corridors will be actively monitored to detect vessels threatening these pipelines
- Communicates position and identity of vessels stopping inside the charted pipeline corridors to waterway stakeholders
- Vessels that appear to be stopping inside one of these corridors will be targeted to receive an automatically generated broadcast specifically addressed to their vessel alerting them that they are in a pipeline corridor and to avoid any contact with the bottom via anchoring, dropping a spud, or grounding.

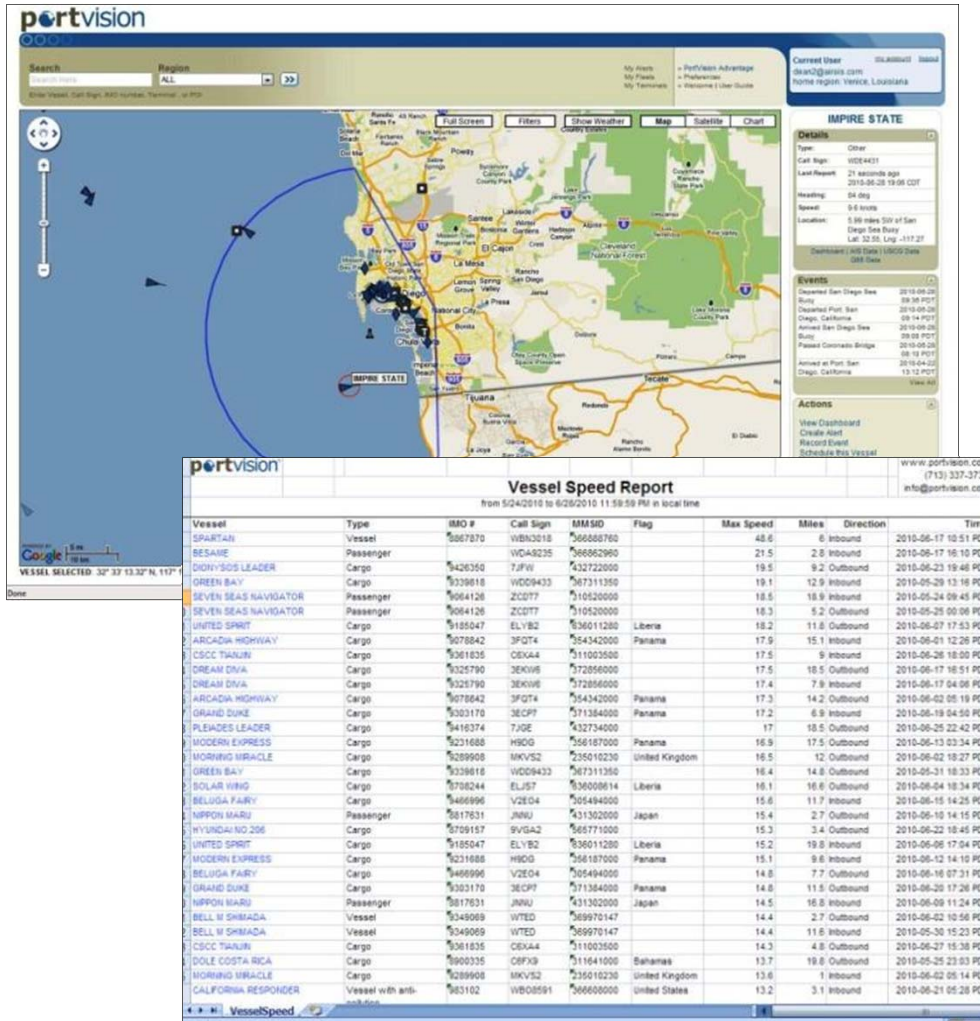


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Port of San Diego-Green Port



- Port of San Diego launched a Clean Air Program which voluntarily asked vessels entering or leaving the Port to observe the set speed limits within a 20 nautical mile from specific point (VSR zone) to reduce emissions.
- The Port needed a system to track vessels and speed.

Results

- While in the VSR zone, a vessel's maximum speed is recorded using an AIS Web-based vessel tracking service to determine VSR program participation.
- Vessel operators who achieve 90 percent compliance are recognized for their participation each quarter.
- Program received a 2011 Winner for Comprehensive Environmental Management Plan-WorkBoat Environmental Awards

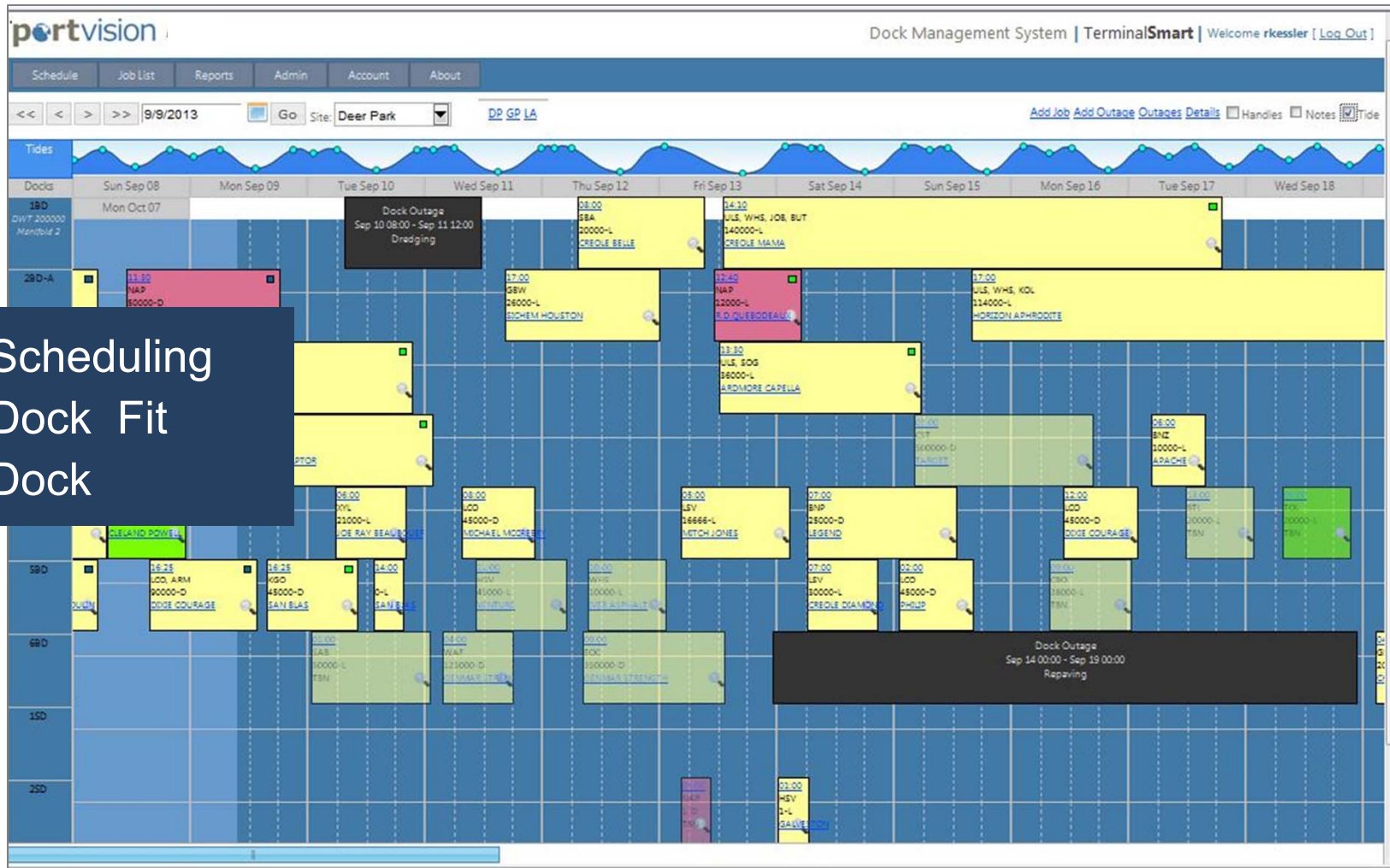


Oceanering International Inc.



Dock Scheduling

- Scheduling
- Dock Fit
- Dock





Gate List



portvision Welcome Agent: Dean Rosenberg

My Gate List My Company Create Gate List

Date: 04/24/2014 | Vessel: Mar

ACME (Employees: 5)

Edwards, Thomas	ID: *****	ID Type:
Fry, Steve	ID: *****	ID Type:
Jennings, Julie	ID: *****	ID Type:
LaVorgna, Andrea	ID: *****	ID Type:
Malone, Brett	ID: *****	ID Type:

Intertek (Employees: 7)
Inchcape (Employees: 3)

1 2 3 4 5 6 7 8 9

Date: 04/17/2014 | Vessel: MIS
Date: 04/10/2014 | Vessel: EAG
Date: 04/02/2014 | Vessel: BLS
Date: 03/27/2014 | Vessel: SAB
Date: 03/21/2014 | Vessel: Mar

Create Gate List

Date:

Vessel:

Terminal:

Vendor Name:

Search List:

ACME (Employees: 5) View Selected Only Select All

Edwards, Thomas	ID: *****	ID Type: DL	Select Employee <input checked="" type="checkbox"/>
Fry, Steve	ID: *****	ID Type: TWIC	Select Employee <input type="checkbox"/>
Jennings, Julie	ID: *****	ID Type: TWIC	Select Employee <input checked="" type="checkbox"/>

Selected: 2

1 2 3 4 5 6 7 8 9 10 ... 1 - 3 of 205 items



Better Visibility & Collaboration Leads to Better Decisions



- Driving growth through improved decision-making and documentation
- Enhancing operations through better accountability



Contact Information



www.portvision.com



Jason Tieman

Director Maritime Operations
PortVision

1.713.337.3737

jtieman@oceaneering.com