



# **Vessel Requirements for Notices of Arrival and Departure and Automatic Identification System**

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*Final Regulatory Analysis and Final Regulatory Flexibility  
Analysis for the Final Rule*

**USCG-2005-21869  
RIN 1625-AA99**

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## Executive Summary

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This regulatory analysis (RA) presents a final assessment of the potential impacts of the requirements contained in the final rule, “Vessel Requirements for the Notice of Arrival and Departure, and Automatic Identification System” [USCG-2005-21869] under Congressional authority provided in the Ports and Waterways Safety Act (PWSA) and the Maritime Transportation Security Act (MTSA) of 2002. We did not attempt to replicate the regulatory language of the final rule or any other supporting documentation in this RA. The regulatory text contained in the final rule, not the text of this RA, will be legally binding.

This RA serves as supporting documentation for certain regulatory requirements addressed in the final rule; specifically, the economic impact analysis related to Executive Order 12866 (“Regulatory Planning and Review”) as supplemented by Executive Order 13563 (“Improving Regulation and Regulatory Review”), and a final assessment of small entity impacts related to the Regulatory Flexibility Act (5 U.S.C. 601-612). It does not provide supporting documentation for other regulatory requirements, environmental impacts, risk assessment, or technology and operational performance issues involved with this rulemaking. The final rule is a significant regulatory action under Executive Order 12866.

The final rule modifies existing regulatory requirements as follows. Notice of arrival (NOA) regulations are expanded to include foreign commercial vessels 300 gross tons (GT) or less that transit 2 or more Captain of the Port zones (COTPs) and U.S. commercial vessels 300 GT and less coming from a foreign port or place. The final rule also requires that NOAs be submitted electronically, and modifies related reporting content, timeframes, and procedures. The final rule adds five fields to the NOA information requirement, only three of which are new to industry: the Maritime Mobile Service Identity (MMSI) number, whether a vessel is 300 GT or less, and whether a vessel’s voyage time is less than 24 hours. The two other fields – last port of departure, and arrival and departure date for last port of departure – are currently required under items 33 CFR 160.206, Table 160.206(2)(i) and (ii) which we are modifying to capture specifically the last port of departure (whether foreign or domestic), and the arrival and departure date, and the last 5 foreign ports or places visited and the dates of arrival and departure for those five visits. In addition, the final rule will remove consolidated NOAs (without the addition of new costs). We also removed our proposed NOD requirement. A foreign-flag vessel 300 GT or less transiting 2 or more COTP zones will be required to submit an NOA. The notice of arrival (NOA) requirements in the final rule are discretionary agency actions that are not expressly required by statute.

The final rule also expands Automatic Identification System (AIS) requirements beyond Vessel Traffic Service (VTS) areas to vessels not on an international voyage, removes an exception for passenger and fishing vessels from the applicability threshold for commercial vessels 65 feet or more in length, towing vessels 26 feet or more in length and 600 horsepower, and expands applicability to certain high-speed craft, dredges and floating plants, and vessels moving CDCs; which aside from dredges, are statutorily mandated size thresholds from section 102 of MTSA, Public Law 107–295, 116 Stat. 2064 . Moreover, the final rule updates International Convention for the Safety of Life at Sea (SOLAS) AIS requirements and permits use of AIS Class B devices for certain vessels not subject to SOLAS. In general, these changes reduce burden from the requirements proposed in the notice of proposed rulemaking (NPRM).

The final rule will enhance our overall maritime domain awareness (MDA) by allowing the Coast Guard to retrieve more AIS and NOA data to meet the safety and security objectives of the Maritime Transportation Security Act of 2002 (MTSA) and the Ports and Waterways Safety Act (PWSA).

With the exception of the addition of the categories of dredges and vessels moving CDC, AIS carriage requirements introduced by the final rule are expressly required by statute. The addition of dredges and vessels moving CDC is based on the unique operating constraints or circumstances associated with these

vessels and the statutory authority of the Secretary under 46 U.S.C. 70114 (a)(1)(D) to decide which vessels need AIS for safe navigation purposes. Regarding the type of equipment required, the Coast Guard exercised its discretion under MTSA to allow vessels specified in 33 CFR 164.46 (b)(2) to use a less costly Class B AIS device in lieu of a Class A AIS device.

The final rule will apply to vessels as follows:

NOA Applicability:

- All foreign commercial vessels arriving at a U.S. port or place, including fishing vessels (foreign recreational vessels 300 GT or less are exempt); currently, with the exception of ferries, all commercial vessels traveling from foreign to U.S. ports and U.S. to foreign ports are required to submit an arrival or departure manifest electronically under the CBP's Advanced Passenger Information System (APIS) final rule;
- All U.S. commercial vessels coming from a foreign port or place 300 GT or less;
- All U.S. commercial vessels coming from a foreign port, including fishing vessels, but excluding recreational vessels, and;
- Foreign-flag commercial vessels 300 GT or less that transit 2 or more COTP zones.

AIS Applicability:

- All self-propelled vessels (U.S.- and foreign-flag) of 65 feet or more in length engaged in commercial service, including fishing vessels;
- All towing vessels of 26 feet or more in length and more than 600 horsepower engaged in commercial service;
- All self-propelled vessels engaged in dredging operations in or near commercial channels or shipping fairways in a manner likely to restrict or affect navigation of other vessels--these vessels pose a navigational risk because of their operation in a restricted channel or fairway, which is not a function of their size;
- Passenger vessels 65 feet or less in length certificated to carry more than 150 passengers , and;
- All self-propelled vessels engaged in the movement of certain dangerous cargo, as defined in subpart C of part 160, including towing a barge loaded with CDC, and vessels moving flammable or combustible liquid cargo in bulk that is listed in 46 CFR 30.25-1, Table 30.25-1.--these vessels, and barges they tow, pose a safety and security risk because of the hazardous cargo being transported;

This RA presents estimated costs incurred by industry (owners and operators of affected vessels) for the NOA and AIS portions of the final rule and presents a benefit analysis based on marine casualty cases for the period 1996-2003. We also examined additional casualty cases for the period 2004-2010, which we discuss later in the report.

Before we published the NPRM on December 16, 2008, CBP published its APIS final rule on [April 7, 2005 \(70 FR 17820\)](#), that mandated the electronic submission of certain passenger and crew information for air and vessel carriers. The APIS final rule, which became effective June 6, 2005, precedes our

requirements for vessels that must submit NOAs electronically, which includes all U.S. and foreign-flag vessels (of any size) coming from and going to a foreign port or place. The cost to submit an NOA electronically using a computer was captured in the APIS final rule. Our requirements for NOA and electronic submission for vessels coming from a foreign port or place are no different than those set forth by CBP in the APIS final rule. Our final rule will require each foreign-flag commercial vessel that arrives in the United States and then makes U.S. port-to-port visits to submit an NOA for each port call, which the APIS final rule does not require. We are also adding three fields that are new to industry to the NOA information requirements as listed above. Sometimes incorrect information submission occurs because some vessel owners and operators fail to submit an update on crew and/or cargo changes. In our final rule, we have modified the submission process to ensure that each port has current information as it relates to crew and cargo. All eNOADs can be made through the National Vessel Movement Center (NVMC) website or through a specific template that allows users to submit information via the Internet directly to the NVMC using the template and the Internet-based Extensible Markup Language (XML), or by email.<sup>1</sup>

The eNOAD system will continue to allow the Coast Guard to meet its NOA requirements and provide synergy with the CBP APIS final rule requirements that should eliminate duplicative reporting. Our requirement for the 96-hour NOA timeframe is the same as CBP's. We anticipate that submitting NOAs by the format above should reduce the burden hours imposed on industry.

- CBP permits only electronic submissions, as will our rule, with no additional burden on industry.
- Our final rule will require foreign-flag commercial vessels 300 GT or less that transit 2 or more COTP zones to submit an NOA, which is a new requirement.
- Vessels operating exclusively within one COTP zone and not carrying a CDC will continue to be exempt from submitting NOAs.
- Ferries that operate on a fixed route between two or more COTP zones and on a regular schedule will automatically be exempt from NOA requirements if they submit the information (which does not require electronic submission) required under alternative § 160.204(a)(5)(vii), which has been a common industry practice since 2003; therefore, no additional cost is associated with this provision. This alternative information is submitted directly to the COTP and not the NVMC, and is submitted only once, prior to operation.

AIS is a system that provides ships, in real time, with the latest information about the identity, voyage data, and maneuvers of other ships that are also equipped with the system. It allows ships to easily track, identify, and exchange pertinent navigation information with one another or ashore for collision avoidance, security, and VTS reporting. We expect the system to enhance situational awareness, permit more effective passing arrangements, and provide VTSs with comprehensive traffic images.

Based on updated NVMC data, we estimate the number of U.S. vessels affected by NOA to be 3,430. We expect the number of foreign-flag vessels affected by the NOA requirements in the final rule to be approximately 14,947. The AIS portion of the final rule will affect approximately 5,848 U.S.-flag vessels and approximately 74 foreign-flag commercial fishing vessels, for a total affected population of approximately 5,922 vessels. See Table ES 1 below. The number of vessels affected by the AIS carriage

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<sup>1</sup> <http://www.nvmc.uscg.gov/nvmc/Items.aspx>

requirement is significantly lower than our estimated population in the NPRM (17,442 vessels U.S. and foreign vessels combined) due to a change in the applicability of the rule and improved data analysis and data filtering. See Tables ES 1 and ES 2 below.

**Table ES 1. Estimated Number of Vessels Affected by Final Rule**

	Vessels to Install AIS	Vessels Affected by NOA
<b>U.S.-Flag Vessels</b>	5,848	3,430
<b>Foreign-Flag Vessels</b>	74	14,947
<b>Total Vessels Affected by Portion of Final Rule</b>	5,922	18,377

Note: Population totals do not sum due to overlap of the requirements. All foreign-flag AIS vessels are a subset of the foreign-flag NOA vessels. Some of the 3,430 U.S. NOA vessels are a subset of the 5,922 U.S. AIS vessels.

**Table ES 2. Comparison of NOAD and AIS Cost and Populations from NPRM to Final Rule**

AIS	NPRM	Final Rule
<b>Cost (\$millions, 7 percent)*</b>	\$130.1	\$46.0
<b>Population (U.S. and Foreign)</b>	17,442	5,922
<b>NOAD</b>	-	-
<b>Cost (\$millions, 7 percent)</b>	\$51.3-\$69.5	\$0.50-\$0.94
<b>Population (U.S. and Foreign)</b>	30,850	18,377

\*Approximately \$71,000 over a 10-year period of analysis is attributable to discretionary provisions.

This RA analyzes the costs and benefits of the final rule over a 10-year period. We discount costs to their present value (PV) at 7- and 3-percent discount rates over the period of analysis. Cost estimates for the AIS portion of the final rule include the cost of the AIS device itself and installation, training, annual maintenance, and replacement costs. The addition of commercial fishing vessels to the existing regulatory community increases the population of vessels carrying AIS and the costs associated with the AIS carriage requirement. Cost estimates for the NOA portion of the final rule include the cost associated with the addition of the three new NOA fields (U.S.- and foreign-flag vessels) and for the inclusion of foreign-flag vessels 300 GT or less that transit 2 or more COTP zones. Quantified, monetized benefit estimates for the AIS portion of the final rule include avoided injuries, fatalities, and pollution. Non-quantified benefits for AIS include enhanced MDA, improved information sharing with NOAD, and improved overall communications between the Coast Guard and other agencies in the Department of Homeland Security, and the owners and operators of vessels that this rule will affect. We expect that non-quantified benefits exist for the NOA portion of the final rule, such as an efficient and timesaving method of notification, thereby reducing the hour burden on industry and Coast Guard resources. This rule seeks to reduce the means of submission that take longer for the Coast Guard to process and for vessel owners to submit; it will also reduce the likelihood of the introduction of data entry errors into the Coast Guard's Ship Arrival Notification System (SANS).

We estimate the total present discounted value or cost of the AIS portion of the final rule to U.S. vessel owners and operators to be between \$45.0 and \$53.4 million at 7- and 3-percent discount rates, respectively, over the 10-year period of analysis. We also estimate the constant annual costs as annualized payments over the 10-year period of analysis at both 7- and 3-percent discount rates for the AIS portion of the final rule. We estimate the annualized costs of the final rule to U.S. vessel owners and operators to be \$6.4 million at a 7 percent discount rate. AIS implementation begins in 2012, with initial year (year 1) cost being approximately \$21.0 million (non-discounted).

Using the mean number of trips made by U.S. vessels annually by U.S. vessels coming from a foreign port or place, we estimate the cost to be between \$201,619 and \$244,868 at 7- and 3-percent discount rates, respectively, over the 10-year period of analysis. We estimate the annual recurring costs (non-discounted) to U.S. vessel owners and operators for the NOA portion of the rule to be about \$28,706 using the mean number of trips made by U.S. vessels annually.

We estimate the total present discounted value or cost of the rule to foreign-flag vessel owners and operators who must carry AIS on board to be between \$591,366 and \$697,186 at 7- and 3-percent discount rates, respectively, over the 10-year period of analysis. We estimate the annualized costs of the final rule to foreign-flag vessel owners and operators to be \$84,197.

Using the mean number of trips made annually to the U.S. by foreign-flag vessels, we estimate the total cost to foreign-flag vessel owners and operators for the NOA portion of the final rule to be between \$733,978 and \$891,423 million at 7- and 3-percent discount rates over the 10-year period of analysis. We estimate the annualized costs to foreign-flag vessel owners and operators for the NOA portion of the rule to be about \$104,502 using the mean number of trips.

The intent of the final rule is to enhance MDA and improve overall communications in conjunction with the AIS requirement. The Coast Guard believes that the final rule, through a combination of NOA and AIS, will strengthen maritime and national security. Specifically, the NOA requirement is combined with other sources of data such as AIS to form a common operating picture in which vessel-specific movements in U.S. ports and waterways can be monitored in real time. This will enable us to filter data from non-compliant collection mechanisms such as radar, thereby enhancing our ability to rapidly detect, identify, and track suspicious vessels. This information is used as a decision-making aid by the Coast Guard field commanders and is also referenced in support of interagency efforts as it pertains to homeland security. Creating this common operating picture allows the Coast Guard an opportunity to prioritize its resources and meet mission requirements while maintaining MDA. Moreover, along with passenger, crew, and cargo information required by CBP, we can determine if a suspicious person is on board a vessel and, with the addition of AIS, we can determine the position of the suspicious vessel.

We expect benefits of this final rule to also include improved safety and environmental protection. As detailed in the NPRM, these benefits exist in the form of avoided injuries and fatalities, and barrels of oil not spilled into the marine environment. We estimate the total discounted benefit (injuries and fatalities) derived from marine casualty cases, including casualty incidents from the data period 1996-2010, for the AIS portion of this final rule, to be between \$25.1 and \$31.2 million, using \$9.1 million for the value of statistical life (VSL) at 7- and 3-percent discount rates, respectively.<sup>2</sup> We expect the AIS portion of this rule to prevent on average 14 barrels of oil (undiscounted) from being spilled annually, or between 85 and 106 barrels at 7- and 3-percent discount rates, respectively, over the 10-year period of analysis. Table ES 3 below summarizes our findings. The estimated costs of this rule exceed its estimated benefits. However, substantial portions of the rule are mandated by statute. In addition, we expect the rule to have benefits that we have not quantified here.

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<sup>2</sup> Fatality values are based on a \$9.1 million value of a statistical life referenced in *Guidance on Treatment of the Economic Value of a Statistical Life in U.S. Department of Transportation Analyses*, US DOT, 2013, available at <http://www.dot.gov/sites/dot.dev/files/docs/VSL%20Guidance%202013.pdf>.

**Table ES 3. Summary of Total 10-Year Discounted Cost and Benefit of Final Rule for U.S.- and Foreign-flag Vessels (7- and 3-percent Discount Rates) (\$Millions)**

Discount Rates	AIS	NOA
<b>Costs</b>		
<b>7-Percent Discount Rate:</b>		
U.S.-flag Vessels	\$45.0	\$0.20
Foreign-flag Vessels	\$0.59	\$0.73
<b>Total Cost</b>	<b>\$46.0</b>	<b>\$0.94</b>
<b>3 -Percent Discount Rate:</b>		
U.S.-flag Vessels	\$53.4	\$0.24
Foreign-flag Vessels	\$0.70	\$0.90
<b>Total Cost</b>	<b>\$54.1</b>	<b>\$1.1</b>
<b>AIS Quantified Benefits</b>		<b>AIS and NOA Non-quantified Benefits</b>
<b>Injuries and Fatalities Avoided:</b>		<ul style="list-style-type: none"> <li>• Enhances MDA.</li> <li>• May identify need for security and safety zones.</li> <li>• Prioritizes inspections.</li> <li>• Creates common operating picture to identify and track potential suspicious vessels.</li> <li>• Creates enhanced interdiction and communication capabilities.</li> </ul>
7-percent discount rate (\$9.1M VSL)	\$25.1	
3-percent discount rate (\$9.1M VSL)	\$31.2	
<b>Pollution Avoided (bbls):*</b>		
7-percent discount rate	85	
3-percent discount rate	106	

Totals may not sum due to independent rounding.

\*We did not find cases involving oil spills from foreign-flag vessels.

The NOA portion of the final rule will not require a new collection of information, but will require an update to an existing one. The AIS portion of the final rule will require a new collection of information under the Paperwork Reduction Act (PRA). This RA includes a Final Regulatory Flexibility Act Analysis (FRFA) that considers the impacts of the final rule to small entities.

## OMB A-4 Accounting Statement

The final rule is a significant regulatory action under section 3(f) of Executive Order 12866, Regulatory Planning and Review. The Office of Management and Budget (OMB) has reviewed it under that Order and under Executive Order 13563, Improving Regulation and Regulatory Review. The Coast Guard has prepared this final assessment (Regulatory Analysis, or RA) of potential costs and benefits as required under each Order.

We have determined that the final rule does not have an annual effect on the economy of \$100 million or more. However, we expect the final rule to be significant under Executive Order 12866 due to its impact on industry. In accordance with OMB Circular A-4 (available at [www.whitehouse.gov/omb/circulars/](http://www.whitehouse.gov/omb/circulars/)), we have prepared an accounting statement showing the classification of impacts associated with the final rule.

**Agency/Program Office:** U.S. Coast Guard

**Rule Title:** Vessel Requirements for Notices of Arrival and Departure and Automatic Identification System

**RIN#:** 1625-AA99

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Category	Primary Estimate		Minimum Estimate		High Estimate		Source
<b>Benefits</b>							
Annualized monetized benefits (\$Millions)	\$3.6	7%	N/A	7%	N/A	7%	RA
	\$3.7	3%	N/A	3%	N/A	3%	
Annualized quantified, but unmonetized, benefits	12 barrels of oil not spilled						
Unquantifiable Benefits	Enhance maritime domain awareness						RA
	Improved information sharing between AIS and NOA						
	Improved overall communications						
<b>Costs</b>							
Annualized monetized costs (\$Millions) (U.S. and Foreign-flag Vessels) (Annual recurring costs are same at 7 and 3 percent discount rates)	\$6.6	7%	NOA: <u>Annual Recurring:</u>  <u>Mean trips \$0.20-\$0.73</u>	7%	N/A	7%	RA
	\$6.5	3%	NOA: <u>Mean trips \$0.24-\$0.89</u>	3%	N/A	3%	RA
Annualized quantified, but unmonetized, costs	Reflected in Row 2 above						RA
Qualitative (un-							
<b>Transfers</b>							
Annualized monetized	None		None		None		

From whom to whom?				
Annualized monetized transfers: "off-budget"	None	None	None	
From whom to whom?	None	None	None	
<b>Miscellaneous Analyses/Category</b>				
Effects on State, local, and/or tribal governments	None	None	None	
Effects on small businesses	Conducted FRFA			RA/FRF A
Effects on wages	None	None	None	
Effects on growth	No determination	No determination	No determination	

Notes: (1) Discount rate appears to the right of the estimates.

# 1. Introduction

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## Purpose and Background

Expanding the applicability of NOA and AIS to additional vessel groups will enhance MDA, which will improve maritime and navigational safety, and supplement the vessel population currently regulated in previously published NOA and AIS rules.<sup>3</sup> We expect benefits of this final rule to include improved security, safety and environmental protection. The Coast Guard believes that this final rule will enhance maritime and navigation safety through a synergistic effect of NOA and AIS, and will strengthen maritime and national security. We assess improvements to safety and environmental protection quantitatively, given the existence of historic casualty data from which to develop such estimates. From the casualty history we can assess the expected mitigation of fatalities, injuries, property damage, and environmental impacts as a result of oil spills from casualty incidents. The collection of information from additional vessels, as outlined in the final rule, will provide the maritime community with better knowledge of the operational nature and position of these vessels, thereby reducing the risk, but not the vulnerability, for all vessels affected. The expanded applicability would further assist the Coast Guard in its mission and responsibility delegated by the Department of Homeland Security (DHS) to ensure that all vessels (under the NOA applicability) making port calls in the United States are identified and tracked in an effort to minimize the inherent risks to our nation's ports.

To better align our rule with the CBP APIS final rule, the Coast Guard will require certain vessels to submit NOAs if coming from a foreign port or place.<sup>4</sup> However, as a supplement to CBP requirements under the APIS final rule, foreign-flag commercial vessels 300 GT or less that transit 2 or more COTP zones will be required to submit NOAs under our final rule. Another difference between the requirements of our final rule and those of the APIS final rule is our 60-minute NOA timeframe for U.S. vessels 300 GT or less, compared to the 24-hour timeframe under CBP's APIS final rule. In our final rule, a U.S. vessel 300 GT or less, arriving from a foreign port or place, whose voyage time is less than 24 hours must submit an NOA at least 60 minutes before departure from a foreign port or place. This creates a similar regulatory requirement as for vessels greater than 300 GT. Under current regulations, if a vessel's voyage time is 96 hours or more, submission of an NOA must be 96 hours before arriving at the port or place of destination. If the voyage time is less than 96 hours, the vessel must submit an NOA before departure but at least 24 hours before arriving at the port or place of destination. Finally, the addition of three new NOA data fields is the other difference between our final rule and APIS. Ferries that operate on a fixed route between two or more COTP zones and on a regular schedule will automatically be exempt from NOA requirements if they submit directly to the COTP using an alternative under 160.204(a)(5)(vii), which has been a common industry practice since 2003 and imposes no new costs on this population of vessels. Vessels operating exclusively within one COTP zone and not carrying a CDC will continue to be exempt from submitting NOAs.

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<sup>3</sup> The Coast Guard published a final rule for Notice of Arrival in February 2003 (68 FR 9537). The Coast Guard subsequently published a temporary final rule (TFR) entitled "Notification of Arrival in U.S. Ports; Certain Dangerous Cargoes; Electronic Submission" in August 2004 and a subsequent interim rule on December 16, 2005 (70 FR 74663). Readers can view these rules and the associated RAs online under docket numbers USCG-2002-11865, USCG-2003-16688, and USCG-2005-19963, respectively, at [www.regulations.gov](http://www.regulations.gov). Under the authority of the Maritime Transportation Security Act of 2002 (MTSA, Public Law 107-295, 116 Stat. 2064), the Coast Guard published a final rule that required the carriage of an AIS on certain domestic vessels in Vessel Traffic Service (VTS) areas and vessels under SOLAS. Readers can also find the rule and the associated RA online under docket number USCG-2003-14757.

<sup>4</sup> CBP published its APIS final rule on April 7, 2005 (70 FR 17820).

The purpose of the final rule is to expand the applicability of NOA and AIS to meet the intent of MTSA, to enhance MDA<sup>5</sup>, and to correlate AIS vessel data with NOA data. The combination of these elements in the final rule will capture a greater number of vessels, thereby enhancing MDA and national security.

## **Changes to Regulations from the NPRM**

We received numerous public comments on both portions of the NPRM. A summary of comments and our responses is available for review in the preamble of the final rule. Most notably on the NOA side, we received several comments concerning ferries and their reporting requirements. The Coast Guard will continue to exempt certain ferries (e.g., ferries operating exclusively within the same COTP zone and not carrying a CDC as described in 33 CFR Part 160.204). Ferries described above, will be eligible for an exemption and typically are granted exemptions by the COTP. We estimate this to be a small population of approximately 150 ferries. Currently, ferries are granted waivers at the discretion of the COTP and we expect this practice to continue. Other minor changes include the length of time to submit an NOA before a voyage commences, modifications to consolidated NOAs, and the addition of three new NOA data fields: the MMSI number, a field to identify a vessel 300 GT or less, and whether a vessel's voyage time is less than 24 hours. In summary, our final rule provides an exemption option for ferries that would not require a ferry owner or operator to submit NOAs unless the ferry is carrying a CDC (we published the NOA/CDC final rule in the Federal Register on September 28, 2010, 75 FR 59617, and estimated the economic impact on vessel owners and operators who operate vessels that carry CDCs) or is transiting two or more COTP zones as described above; otherwise, ferries are exempt from NOA requirements or can be—and typically are—granted waivers at the discretion of each COTP. Again, no vessel is required to submit an NOD. Ferries are also exempt from NOA requirements under the CBP's APIS final rule. However, our final rule will require foreign-flag commercial vessels 300 GT or less that transit 2 or more COTP zones to submit NOAs. Each U.S. vessel 300 GT or less, arriving from a foreign port or place and not carrying a CDC, whose voyage time is less than 24 hours must submit an NOA at least 60 minutes before departure from the foreign port or place. This 60-minute-before-departure provision also applies to Canadian vessels 300 gross tons or less, arriving directly from Canada, via boundary waters, to a United States port or place on the Great Lakes. Under this final rule, all other vessels on a voyage of less than 24 hours must submit on the same timeline as CBP's APIS final rule: at least 24 hours prior to arrival. See the regulatory text section of our final rule for greater detail.

The final rule will revise and clarify sections for NOA in 33 CFR Part 160.201, 160.202, 160.203, 160.204, 160.205, 160.206, 160.207, 160.208, 160.210, 160.212, 160.213, and 160.215.

We also received numerous public comments on the AIS carriage portion of the final rule. Based on these comments, the Coast Guard will revise its existing regulations to allow certain classes of vessels to carry less costly Class B AIS devices.

Other comments concerned the installation cost for AIS devices. The Coast Guard is not requiring integration of an AIS device with other systems on board. AIS can be installed and operated as a stand-alone item. Therefore, we do not expect owners and operators to incur additional installation costs over and above the estimates in the NPRM.

There are also other administrative changes and clarifications which we do not expect will impose new costs on industry. See Tables 1 and 2 below or the regulatory text section of the final rule for greater detail.

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<sup>5</sup> The Coast Guard's definition of maritime domain awareness is "the effective understanding of anything associated with the global maritime environment that could impact the security, safety, economy, or environment of the United States."

The final rule will revise and clarify sections for AIS in 33 CFR Parts 62, 66, 161, 164, and 165. See Tables 1 and 2 below for a summary of NOAD and AIS regulatory changes, respectively.

**Table 1. NOAD Regulatory Changes from NPRM to Final Rule for 33 CFR 160**

*NOAD Change Matrix*  
**33 CFR Part 160 Ports and Waterways Safety-General**  
*Subpart C Notification of Arrival and Departure, Hazardous Conditions, and Certain Dangerous Cargoes*

<b>Final Rule Text (if change)</b>	<b>Proposed Rule Text</b>	<b>Cost Impact of Final Rule (Annual)</b>	<b>Explanation</b>
<p><b>§ 160.203</b> (a) This subpart applies to U.S. vessels in commercial service and all foreign vessels that are bound for or departing from ports or places within the navigable waters of the United States, as defined in 33 CFR 2.36(a), which includes internal waters and the territorial seas of the United States, and any deepwater port as defined in 33 CFR 148.5.</p>	<p>This subpart applies to U.S. vessels in commercial service and all foreign vessels that are bound for or departing from ports or places of the United States.</p>	<p>Cost impact:</p> <p><b>U.S. Vessels</b> Mean trips: \$28,706</p> <p><b>Foreign Vessels</b> Mean trips: \$104,502</p>	<p>Adds costs for 3 additional NOA fields to U.S. and foreign vessels 300 GT or less that transit within U.S. navigable waters or from 1 COTP zone to another. U.S. vessels 300 GT or less that make U.S.-to-U.S. port transits, unless carrying a CDC, are otherwise exempted. If carrying a CDC, they are already required to submit an NOA.</p>
<p><b>§ 160.204</b> (a) No change from NPRM</p>	<p>Except for reporting notice of hazardous conditions, the following vessels are exempt from requirements in this subpart:</p>	<p>Minor reduction in cost. Cost reduction not quantified since Coast Guard does not capture data for salvaging vessels. Due to the nature of salvaging operations, which may require numerous short trips to and from shore, the NOA exemption provides relief to these vessel owners by reducing the burden of NOA submissions.</p>	<p>Vessels excluded from NPRM regulatory impact analysis. Number of vessels engaged in salvaging and reporting of hazardous conditions unknown, Coast Guard anticipates number to be small; minor reduction in cost.</p>
<p>(1) No change from NPRM</p>	<p>A passenger or offshore supply vessel when employed in the exploration for or in the removal of oil, gas, or mineral resources on the continental shelf.</p>	<p>No cost impact</p>	<p>No change</p>
<p>(2) No change from NPRM</p>	<p>An oil spill response vessel (OSRV) when</p>	<p>No cost impact</p>	<p>No change</p>

	engaged in actual spill response operations or during spill response exercises.		
(3) After January 15, 2013, a vessel required by 33 CFR 165.830 or 165.921 to report its movements, its cargo, or the cargo in barges it is towing.	A vessel required by 33 CFR 165.830 or 165.921 to report to the Inland River Vessel Movement Center (IRVMC).	No cost impact	Vessels exempted
(4) A United States or Canadian vessel engaged in the salvaging operations of any property wrecked, or rendering aid and assistance to any vessels wrecked, disabled, or in distress, in waters specified in Article II of the 1908 Treaty of Extradition, Wrecking and Salvage (35 Stat. 2035; Treaty Series 502)	No corresponding paragraph.	No corresponding paragraph. Minor cost reduction. Cost reduction not quantified as previously described. Due to the nature of salvaging operations, which may require numerous short trips to and from shore, the NOA exemption provides relief to these vessel owners by reducing the burden of NOA submissions.	Coast Guard does not retain data on number of vessels engaged in these activities; therefore no estimates in cost reductions made.
(5) No change from NPRM	The following vessels neither carrying certain dangerous cargo nor controlling another vessel carrying certain dangerous cargo:	No cost impact	No change
(i)_No change from NPRM	A foreign vessel 300 GT or less not engaged in commercial service.	No cost impact	No change
(ii)_No change from NPRM	A vessel operating exclusively within a single Captain of the Port Zone. Captain of the Port zones are defined in 33 CFR part 3.	No cost impact	No change
(iii)_ A U.S. towing vessel and a U.S. barge operating solely between ports or places of the contiguous 48 states, Alaska, and the District of Columbia.	A U.S. towing vessel and a U.S. barge operating solely between ports or places of the continental United States.	No cost impact	Editorial changes
(iv)_No change from NPRM	A public vessel.	No cost impact	No change
(v)_No change from NPRM	Except for a tank vessel, a U.S. vessel operating solely between ports or places of the United States on	No cost impact	No change

	the Great Lakes.		
(vi)_No change from NPRM	A U.S. vessel 300 GT or less, engaged in commercial service not coming from a foreign port or place.	No cost impact	No change
(vii) Each ferry on a fixed route that is described in a schedule that is submitted by the ferry operator, along with information in paragraphs (vii)(A)-(J) of this section, to the Captain of the Port for each port or place of destination listed in the schedule at least 24 hours in advance of the first date and time of arrival listed on the schedule. At least 24 hours before the first date and time of arrival listed on the ferry schedule, each ferry operator who submits a schedule under paragraph (vii) of this section must also provide the following information to the Captain of the Port for each port or place of destination listed in the schedule for the ferry: (A) Name of the vessel; (B) Country of registry of the vessel; (C) Call sign of the vessel; (D) International Maritime Organization (IMO) international number or, if the vessel does not have an assigned IMO international number, the official number of the vessel; (E) Name of the registered owner of the vessel; (F) Name of the operator of the vessel; (G) Name of the vessel's classification society or recognized organization, if applicable; (H) Each port or place of destination; (I) Estimated dates and times of arrivals at and departures from these ports or places; and  (J) Name and telephone number of a 24-hour point of contact.	No corresponding paragraph.	No cost impact	No change, this has been a common industry practice since 2003. Also, COTPs at their discretion have consistently granted waivers to ferries in the past and will continue to do so in the future. Population of affected ferries estimated to be 150.
(6) [INSERT DATE 90 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER] through December 31, 2015, vessels identified as being subject to 33 CFR 165.830 or	No corresponding paragraph	No cost impact	Editorial change

165.921.			
§ 160.215 No change from NPRM	When a vessel is bound for a port or place of the United States under force majeure, it must comply with the requirements in this section, but not other sections of this subpart.	No cost impact	No change

**Table 2. AIS Regulatory Changes from NPRM to Final Rule for 33 CFR 164.46**

*AIS Change Matrix*  
*33 CFR 164.46 Automatic Identification System*

<b>Final Rule Text (if change)</b>	<b>Proposed RuleText</b>	<b>Cost Impact of Final Rule (Annualized)</b>	<b>Explanation</b>
§ 164.46 (b)(1) The following vessels must have on board a properly installed, operational Coast Guard type-approved AIS Class A device:	The following vessels must have onboard a properly installed, operational, Coast Guard type-approved Automatic Identification System (AIS):	No cost impact	Editorial changes
(i) No change from NPRM	A self-propelled vessel of 65 feet or more in length, engaged in commercial service;	Cost impact  Annualized Cost (7%): \$4.4 million	Vessels previously included in NPRM population
(ii) A towing vessel of 26 feet or more in length and more than 600 horsepower, engaged in commercial service.	A towing vessel of 26 feet or more in length and more than 600 horsepower, engaged in commercial towing;	Cost impact  Annualized Cost (7%): \$2.0 million	Vessels previously included in NPRM population
(iii) A vessel that is certificated to carry more than 150 passengers.	A self-propelled vessel carrying 50 or more passengers, engaged in commercial service;	Cost impact  Cost included in 65 feet or more category above or (i).	Includes affected vessels in (b)(3)
(iv) A self-propelled vessel engaged in dredging operations in or near a commercial channel or shipping fairway in a manner likely to restrict or affect navigation of other vessels.	A dredge or floating plant engaged in or near a commercial channel or shipping fairway in operations likely to restrict or affect navigation of other vessels except for an unmanned or intermittently manned floating	Cost impact  Annualized Cost (7%): \$10,000	Vessels previously included in NPRM population

	plant under the control of a dredge; and		
(v) A self-propelled vessel engaged in the movement – (A) Certain dangerous cargo as defined in subpart C of part 160 of this chapter, or (B) Flammable or combustible liquid cargo in bulk that is listed in 46 CFR 30.25–1, Table 30.25–1.	A self-propelled vessel carrying or engaged in the movement of certain dangerous cargoes as defined in § 160.202 of this subchapter.	Cost impact  Cost: Undetermined, all vessels in this category are included in the 65 feet or more category. We found no vessels carrying CDCs that are less than 65 feet in length.	Vessels previously included in NPRM population
(b)(2) AIS Class B device. Use of a U.S. Coast Guard type-approved AIS Class B device in lieu of an AIS Class A device is permissible on the following vessels if they are not subject to pilotage by other than the vessel Master or crew:	NO CORRESPONDING PARAGRAPH, but see explanatory “Note to paragraph (b): Except for those vessels denoted in paragraph (c) of this section, use of Coast Guard type-approved AIS Class B is permissible, however, not well-suited, on vessels that are highly maneuverable, navigate at high speed, or routinely operate on or near very congested waterways or in close-quarter situations with other AIS equipped vessels.”	Reduction in cost impact for owners and operators of fishing vessels, dredging vessels, and certain passenger vessels. Class A AIS is more costly than Class B AIS.	Certain vessel classes will be required to carry Class A AIS devices and certain vessel classes, as stated in the middle column, will have option to carry Class B AIS devices, resulting in overall cost reduction to industry and of the rule. Change in cost estimates based on cost differential between Class A and B AIS devices. Cost impact for vessels in (b)(4) that operate at speeds in excess of 14 knots uncertain due to lack of complete vessel speed data in MISLE.
(i) Fishing industry vessels	NO CORRESPONDING PARAGRAPH.	Reduction in cost impact due to allowance of Class B devices	Change from NPRM
(ii) Vessels identified in paragraph (b)(1)(iv) of this section engaged in dredging operations; and	NO CORRESPONDING PARAGRAPH.	Reduction in cost impact due to allowance of Class B devices	Change from NPRM
(iii) Vessels that are certificated to carry more than 150 passengers, that are less than 65 feet in length, that do not operate in a VTS or VMRS area defined in table 161.12(c) of § 161.12 of this chapter, and that are not capable of speeds in excess of 14 knots.	NO CORRESPONDING PARAGRAPH.	Cost Impact  Cost: \$0	Change from NPRM. We found no passenger vessels less than 65 in length that carry more than 150 passengers.
(c) SOLAS provisions. The following self-propelled vessels must comply	SOLAS provisions. The following self-	No cost impact	Editorial changes

with International Convention for Safety of Life at Sea (SOLAS), as amended, Chapter V, regulation 19.2.1.6 (Positioning System), 19.2.4 (AIS Class A), and 19.2.3.5 (Transmitting Heading Device) or 19.2.5.1 (Gyro Compass) as applicable (Incorporated by reference, see § 164.03):	propelled vessels must comply with International Convention for Safety of Life at Sea (SOLAS), as amended, Chapter V, regulation 19.2.1.6, 19.2.4 (AIS Class A), and 19.2.3.5 or 19.2.5.1 as applicable (Incorporated by reference, see § 164.03):		
Deleted paragraph.	A vessel of 500 gross tonnage or more;	No cost impact	No change in vessel population, all vessels included in 65 ft. or more category
(1) A vessel of 300 gross tonnage or more, on an international voyage.	A vessel of 300 gross tonnage or more, on an international voyage; and	No cost impact	Editorial changes
(2) No change from NPRM	A vessel of 150 gross tonnage or more, when carrying more than 12 passengers on an international voyage.	No cost impact	Editorial change

### **Comparison of Regulatory Impact Changes Between the NPRM and Final Rule**

Figure 1 provides a comparison of regulatory impacts resulting from changes between the NRPM and the final rule. See the final rule for additional discussion of changes.

**Figure 1. Comparison of Regulatory Impact Changes Between the NPRM and Final Rule (in Millions)**

Category	NPRM	Final Rule	Reason for Change
Compliance Start Date	<p><u>NOAD</u>: Beginning 2009</p> <p><u>AIS</u>: Mid 2009</p>	<p><u>NOA</u>: 90 days after publication in the Federal Register Foreign Costs: Mean trips, \$0.73-\$0.89 million (7 and 3 percent)</p> <p>U.S. Costs: Mean trips, \$0.20- \$0.24 million (7 and 3 percent)</p> <p><u>AIS</u>: 13 months after publication in the Federal Register Foreign Cost: \$0.58-\$0.69 million (7 and 3 percent)</p> <p>U.S. cost: \$45.0-\$53.4 million (7 and 3 percent)</p>	Extension of compliance start date
Number of vessels affected	<p><u>NOAD</u>: 30,850 U.S. and foreign</p> <p><u>AIS</u>: 17,442 U.S. and foreign</p>	<p><u>NOA</u>: 18,377 U.S. and foreign vessels</p> <p><u>AIS</u>: 5,922 U.S. and foreign vessels</p>	Change in applicability as well as improved data, which explains why estimates in final rule are lower than in NPRM.
Costs (\$ millions,7 percent discount rate) (U.S. and Foreign vessels combined)	<p><u>NOAD</u>: 10-year: \$51.3 - \$69.5 Annualized: \$7.3 - \$9.7</p> <p><u>AIS</u>: 10-year: \$130.1 Annualized: \$18.0</p> <p><u>Total</u>: 10-year: \$181.4-\$199.6 Annualized: \$25.3 - \$27.7</p>	<p><u>NOA</u>: 10-year: \$935,597 Annualized: \$133,208 (above NOA costs not in millions)</p> <p><u>AIS</u>: 10-year: \$46.0 Annualized: \$6.5</p> <p><u>Total</u> : 10-year: \$46.5 Annualized: \$6.6</p>	Reduction in NOAD costs due to elimination of NOD requirement, the addition of several exemptions and an exception; also existing CBP regulations for electronic submissions allowed require computers and Internet access, so no additional burden is added by these regulations. Change in AIS applicability; additional flexibility for compliance to include the less costly Class B AIS devices on certain classes of vessels
Benefits (\$ millions,7 percent discount rate)	<p><u>NOAD &amp; AIS</u>: Enhanced maritime domain awareness, synergy between both portions of rule; improved communication</p>	<p><u>NOA &amp; AIS</u>: Enhanced maritime domain awareness, synergy between both portions of rule; improved communication</p>	Extension of compliance start date; change in applicability
Benefits (\$ millions,7 percent discount rate)	<p><u>AIS</u>:</p>		Extension of compliance start date; change in applicability

	<p>10-year: \$24.7 million (avoided injuries, fatalities)  Annualized: \$3.5 million (avoided injuries, fatalities)</p> <p>136 barrels of oil not spilled (10-year)</p>	<p><u>AIS:</u>  10-year: \$25.1 million (avoided injuries, fatalities)  Annualized: \$3.7 million (avoided injuries, fatalities)</p> <p>85 barrels of oil not spilled (10-year)</p>	
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## **Need for Regulatory Action**

Some vessel owners and operators who do not carry AIS on board or fail to consistently submit NOAs pose a threat to other vessel owners and operators and to MDA in general. In addition, the lack of AIS on board and the failure to submit an NOA pose potential security threats to the United States and its ports. Some vessel owners and operators without AIS on board risk the possibility of a marine incident that would result in potential costs to the general public. The combination of these NOA and AIS regulatory regimes addresses security and safety shortcomings that would otherwise exist in the maritime environment and it allows the Coast Guard to interdict vessels that are potential threats.

The submission of NOAs gives the Coast Guard advance notice of a vessel's arrival, and includes information about its crew, passengers, cargo, vessel security plans, vessel oil spill response plan, vessels's call sign, and the security officer's 24-hour contact information. AIS enhances maritime domain awareness by showing a vessel's location providing the Coast Guard and other mariner's with real-time positioning of the vessel in addition to real-time identification of a vessel. These combined regulatory regimes aid the Coast Guard in its effort to identify potential terrorist threats such as the smuggling of weapons and/or persons through cargo and crew information. Any unexplained anomaly or contradictory information, such as a vessel not transmitting AIS or broadcasting misinformation, will be viewed as suspicious activity. AIS broadcasts from the vessel will enable the Coast Guard to more readily identify the vessel's current position and course and better enable it to interdict the vessel before it reaches a port or place in the United States.

The final rule intends to increase MDA and create a synergistic effect between AIS requirements and the NOA requirements. The AIS requirements and the NOA requirements have been in place in some segments of the industry for many years. The final rule will add additional types of vessels that must comply with these requirements, with the purpose of identifying vessels that are arriving from foreign ports or places, as well as maintaining the safety of navigable waters of the United States. In the past, we had limited ability to match and track vessels. The combination of the NOA and AIS regulatory regimes allows the Coast Guard to quickly match vessel information and position, which gives the Coast Guard a strong ability to interdict vessels that may pose a threat to the United States. With NOA and AIS data combined, the Coast Guard can better prioritize its resources and create a risk-based approach to help us determine the level of risk associated with vessels attempting to enter the United States thereby improving the overall maritime domain awareness.

## **Summary of Basis and Purpose of Final Rule**

The final rule makes revisions to NOA regulations in 33 CFR part 160 that are necessary to ensure receipt of comprehensive and timely information on vessels entering U.S. ports and transiting U.S. waters. Also, the revision requiring electronic submissions (eNOADs) will expedite processing of NOA information. Prompt receipt of this information about a vessel and its voyage, cargo, and persons on board, and the operational condition of its navigation equipment will assist us in—

- Preventing damage to structures on, in, or adjacent to the navigable waters of the United States;
- Protecting those navigable waters; and
- Preventing or responding to acts of terrorism.

The Secretary of the Department of Homeland Security has delegated to the Coast Guard authority from the Ports and Waterways Safety Act (PWSA) (33 U.S.C. 1221–1232). Under this authority, the Coast Guard may promulgate regulations to–

- Require receipt of prearrival messages from vessels destined for a U.S. port or place in sufficient time to permit advance vessel traffic planning prior to port entry.
- Protect the navigable waters of the United States, as well as bridges over those waters, and land structures and shore area immediately adjacent to such waters, including measures involving the movement of explosives or other dangerous articles and substances.
- Prevent or respond to an act of terrorism within or adjacent to the marine environment.

See specifically 33 U.S.C. 1223(a)(5), 1225, 1226, and 1231.

The final rule also amends AIS and AIS-related regulations in 33 CFR parts 62, 66, 161, 164, and 165 necessary to implement section 102 of MTSA, Public Law 107–295, 116 Stat. 2064, which directs that AIS be installed and operating on most commercial vessels on the navigable waters of the United States. See 46 U.S.C. 70114. In addition, the final rule implements mandatory provisions of SOLAS. See specifically SOLAS, Chapter V, regulation 19.2.4, which requires all ships of 300 GT or more engaged on international voyages, cargo ships of 500 GT or more not engaged on international voyages, and passenger ships irrespective of size, to be fitted with AIS (the SOLAS AIS requirement for ships 500 GT or more that do not engage on international voyages and that were constructed before July 2002, has a July 1, 2008 implementation date, and is not currently expressly reflected in the CFR. The final rule expressly includes that requirement. We do, however, estimate that these vessels are captured by our domestic requirement for commercial vessels 65 feet or more in length to install and operate AIS). As a Contracting Government to SOLAS, the United States has a responsibility to implement mandatory SOLAS provisions such as these AIS, SOLAS Chapter V provisions. See SOLAS Art. I, SOLAS, 32 U.S.T. 47, and the Protocol of 1978 relating to SOLAS, 32 U.S.T. 5577. In addition, the final rule implements section 102 of MTSA, Public Law 107–295, 116 Stat. 2064, which directs that AIS be installed and operable on most commercial self-propelled vessels, towing vessels, and passenger vessels, as determined by the Secretary; on the navigable waters of the United States (see 46 U.S.C. 70114). As with NOA data, AIS data also assist us in traffic management, safety, and security. In summary, vessels required to carry AIS by statutory requirement are self-propelled vessels 65 feet or more in length, engaged in commercial service, and towing vessels 26 feet or more in length and more than 600 horsepower, engaged in commercial towing. Also, SOLAS 1.4 gives the United States discretion in implementing AIS requirements for ships less than 150 GT.<sup>6</sup>

The combination of these NOA and AIS revisions will help provide a comprehensive picture of the maritime domain. These NOA and AIS data go into a common operating picture that uses input from various sources to provide both a visual display of marine traffic and a display of each vessel’s accompanying information. This system allows us to access these data elements and to review them against one another to detect anomalies.

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<sup>6</sup> See SOLAS Chapter V at: <http://www.imo.org/ourwork/facilitation/documents/solas%20v%20on%20safety%20of%20navigation.pdf>

## Regulatory Alternatives

We considered two alternatives under the NOA portion of the final rule. We originally contemplated reducing the vessel size threshold for NOAs submissions for vessels coming from a foreign port to 100 GT, since we believed these vessels would be likely candidates to be used in a maritime transportation security incident. However, we determined that reducing the tonnage threshold to 0 would give us a more complete operational picture of the maritime domain. This will serve two purposes; it will allow visibility on owners and operators of smaller vessels as well as align our regulations with CBP regulations, which require NOA information regardless of tonnage if a vessel is transiting to or from a foreign port or place. These smaller vessels also pose a unique threat due to their size, and can be used as weapons, targets, or transports of suspicious persons, materials, and/or weapons of mass destruction (WMD) and/or weapons of mass effect (WME). NOA data for all vessels coming from a foreign port or place will allow us to identify and assess a vessel's threat level based on size, cargo, crew, and route. AIS will then allow us to determine the position of a suspicious vessel. Utilizing NOA data in 2011, Coast Guard Port State Control Officers targeted 8,909 vessels for security exams. During these exams, 237 deficiencies and 15 major control actions were issued for security related items, which enabled the Coast Guard to detect, identify, and deter suspicious vessels.<sup>7</sup>

As noted above, in April 2005, the CBP published its APIS final rule that required all vessels coming from or departing to a foreign port or place to submit arrival and departure manifests electronically. These CBP requirements for electronic submissions precede our requirements. In 2007, CBP amended 19 CFR 4.64 to require the submission of departure manifests at least 60 minutes—instead of 15 minutes—before departure (72 FR 48320, August 23, 2007). In our final rule, the NOA requirements for vessels arriving at a U.S. port or place from a foreign port or place align with CBP requirements. We are also adding three new fields to the NOA form.

We also considered eliminating the population of U.S. commercial vessels 300 GT or less coming from a foreign port or place (2,467 vessels originally estimated). This GT measurement is one of a number of standard thresholds used for Coast Guard regulations. However, based on an April 2008 report by a DHS working group, titled “Small Vessel Security Strategy” (SVSS), small vessels<sup>8</sup> have been identified as being readily vulnerable to potential exploitation by terrorists, smugglers of WMD, narcotics, other contraband, aliens, and other criminals in addition to Waterborne Improvised Explosive Devices (WBIEDs).<sup>9</sup> These vessels pose a certain risk and can be used to smuggle terrorists or a WMD into the United States or may be used as a stand-off weapon platform or a means of a direct attack from a WBIED. In addition, many small vessels are not registered, and the ability to screen and detect potential threat vessels has been limited in the past. The SVSS also identifies specific security concerns for small vessel such as proximity to critical infrastructure and key resources, as well as transportation channels and military vessels, which are high-profile targets. The DHS report also notes that in the past, it has been difficult to identify small vessel owners and operators because of uneven reporting requirements and user documentation and certification. Furthermore, our SANS and APIS databases allow us to

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<sup>7</sup> See USCG Port State Control in the United States 2011 Annual Report at 19. A major control action occurs when the Coast Guard, for security reasons, either detains or expels a vessel for not being in compliance with the International Ship and Port Security (ISPS) code.

<sup>8</sup> Small vessels are characterized as any watercraft regardless of method of propulsion, less than 300 GT. Small vessels can include commercial fishing vessels, recreational boats and yachts, towing vessels, uninspected passenger vessels, or any other commercial vessels involved in foreign or U.S. voyages.

<sup>9</sup> <http://www.dhs.gov/xlibrary/assets/small-vessel-security-strategy.pdf>

screen smaller vessels now as easily as larger vessels thereby eliminating the distinction based on vessel size.

Using a risk-based approach, the combination of NOA and AIS will help screen the realistic risks posed by small vessels and help identify which vessels are low risk and which vessels are high risk, thereby creating a comprehensive risk picture of the maritime environment. The risk-based approach will also enable the Coast Guard to prioritize its resources to achieve this goal and to share common information between enforcing authorities to identify threats from the small vessel population. As the DHS report notes, “improving reporting procedures is essential to increasing reporting compliance and gathering data for risk-based efforts. As such, obtaining advance data for international traffic, such as the 96-hour Notice of Arrival rule, will allow the USCG and CBP to conduct the necessary risk-based analysis, gain situational awareness of small vessels, and improve the overall MDA. These simple reporting requirements will also improve the effectiveness of risk assessment efforts.”

Again, for the reasons stated above, we chose to include this population of vessels in an effort to strengthen the security of the United States and for the safety of smaller vessels in our effort to enhance MDA. The CBP APIS final rule requires commercial vessels coming from and going to a foreign port to submit arrival and departure manifests; our final rule now aligns with this CBP APIS requirement.

The Coast Guard considered Class A AIS devices for all vessel types and also contemplated a 50 passenger threshold for AIS carriage. However, with this rule, we provide vessel owners and operators additional flexibility for compliance with the AIS requirements to include Class B AIS device on certain classes of vessels. Class B AIS devices are compatible and less expensive, but not as functional as AIS Class A devices. Class B devices also lack safety-related text messaging capability, are not as powerful as Class A devices (they transmit two watts compared to 12.5 watts for Class A devices), and lack the versatility of Class A devices because they do not have the capability to interface with external sensors or displays.<sup>10</sup> Based on public comments, we removed the 50-passenger threshold as an alternative and used a 12-passenger threshold instead. We considered carriage of AIS devices on passenger vessels that carry more than 12 passengers since it is passenger vessel threshold mandated by SOLAS regardless of size and type of voyage. This would have ensured that the vast majority of vessels engaged in the transport of passengers had the additional protections afforded by the final rule. Furthermore, the benefits of AIS are not just to those vessels transmitting but also to those vessels receiving the broadcast and thus able to avoid mishaps. However, the domestic population of passenger vessels that carry more than 12 passengers and up to 150 is estimated to be 4,450 vessels, most of which are owned by small entities. We estimate the cost for the carriage (including installation and operation and maintenance costs and the cost of initialization and updates) of AIS devices (assuming Class A devices) on this population of vessels to be between \$36.0 and \$42.4 million at 7- and 3-percent discount rates, respectively over a 10-year period of analysis. This would have been a burden for small entities that operate these vessels with very few marginal benefits; therefore, the Coast Guard rejected this passenger vessel threshold for AIS carriage.

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<sup>10</sup> See more detailed information at: [http://www.navcen.uscg.gov/pdf/AIS\\_Comparison\\_By\\_Class.pdf](http://www.navcen.uscg.gov/pdf/AIS_Comparison_By_Class.pdf)

## Population Affected

The final rule will affect owners and operators of vessels that will be required to submit NOAs under the requirements of 33 CFR Part 160. This includes vessels coming from and departing to a foreign port or place. Other vessels that will be required to submit NOAs are towing vessels controlling a barge or barges that move CDCs. The final rule will also require certain vessels navigating outside VTS areas and on the navigable waters of the United States to carry an AIS device on board under 33 CFR Parts 66, 161, 164, and 165. We estimate the total number of U.S.-flag vessels affected by the AIS portion of the final rule to be 5,848 and the total number of foreign-flag vessels, all of which are commercial fishing vessels, to be 74. The final rule will require foreign-flag commercial vessels 300 GT or less transiting 2 or more COTP zones to submit NOAs. With the addition of three new NOA fields, the NOA portion of the final rule will affect approximately 3,430 U.S.-flag vessels and 14,947 foreign-flag vessels. The population estimates differ from the NPRM due to improved data gathering and analysis in addition to CBP's existing requirements for arrival manifest submissions. In addition, data from the National Vessel Movement Center (NVMC) provided us with more accurate population figures for NOA.

## Regulatory Analysis

Under Executive Order 12866, Regulatory Planning and Review, as supplemented by Executive Order 13563, Improving Regulation and Regulatory Review, the Coast Guard is required to conduct an analysis of the costs and benefits of its rulemakings. The final rule is not economically significant under that Order. We estimate that the final rule would not have an annual affect on the economy of \$100 million or more.<sup>11</sup> This final RA provides supporting documentation for the final rule, "Vessel Requirements for Notices of Arrival and Departure, and Automatic Identification System" [USCG-2005-21869].

This RA presents the analysis of costs and benefits of the final rule for the expanded applicability of AIS and NOA. The period of analysis is 10 years. We discount costs and benefits at 7- and 3-percent discount rates.<sup>12</sup>

Chapter 2 presents the NOAD costs and benefits.

Chapter 3 presents the AIS costs and benefits.

Chapter 4 presents the Final Regulatory Flexibility Act (FRFA) analysis.

Chapter 5 presents the Paperwork Reduction Act (PRA) analysis.

### Chapter Contents

1. Introduction
2. NOAD Costs and Benefits
3. AIS Costs and Benefits
4. Final Regulatory Flexibility Act (FRFA) analysis
5. Paperwork Reduction Act (PRA) analysis

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<sup>11</sup> Executive Order 12866, (3)(f): "Significant regulatory action" means any regulatory action that is likely to result in a regulation that may: (1) Have an annual effect on the economy of \$100 million or more or adversely affect in a material way the economy, a sector of the economy, productivity, competition, jobs, the environment, public health or safety, or State, local, or tribal governments or communities; (2) Create a serious inconsistency or otherwise interfere with an action taken or planned by another agency; (3) Materially alter the budgetary impact of entitlements, grants, user fees, or loan programs or the rights and obligations of recipients thereof; or (4) Raise novel legal or policy issues arising out of legal mandates, the President's priorities, or the principles set forth in this Executive Order.

<sup>12</sup> The Office of Management and Budget (OMB) Circular A-4 recommends using 3 and 7 percent discount rates for regulatory analyses. Readers can view the Circular online at <http://www.whitehouse.gov/omb/circulars/index.html>.

## **2. Notice of Arrival and Departure (NOAD)**

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On February 28, 2003, the Coast Guard published a final rule (68 FR 9537) for the notification of arrival (NOA) in U.S. ports or places. Vessels coming from any port have to submit notices of arrival 96 hours in advance to the National Vessel Movement Center (NVMC) by fax, phone, e-mail, etc. In an ongoing effort to assess security concerns, the Coast Guard published a temporary final rule (TFR) on August 18, 2004, that added two cargoes, ammonium nitrate (except the residue of ammonium nitrate or the residue of ammonium nitrate-based fertilizers) and propylene oxide, to the list for which an NOA is required. In addition, the TFR provided the option for two new means of electronic submittal of NOA reports to barge owners and operators. These two new methods are the Internet and the Internet-based eXtensible Markup Language (XML).

The TFR for NOA was in effect until March 2006. The costs contained in the TFR were estimated for an 18-month period that included all of 2004 and the first 6 months of 2005 when the TFR was set to expire. The August 2004 TFR also provided the option of electronic submittal of NOAs to the NVMC by three methods. The final rule will require electronic submission of NOAs. The interim rule, published on December 16, 2005 (70 FR 74663), adopted the temporary final rule's definition of "certain dangerous cargo" and is currently in effect.

Our change to a 60-minute timeframe for submitting NOAs provides flexibility for owners and operators of U.S. vessels 300 GT or less that are predominantly small entities. If a vessel's voyage time is 96 hours or more, submission of an NOA must be 96 hours before arriving at the port or place of destination. If the voyage time is less than 96 hours, a vessel must submit an NOA before departure but at least 24 hours before arriving at the port or place of destination in the United States. These businesses would continue to be able to operate efficiently as charter businesses because of the spontaneous nature of their industry. This requirement also aligns with the CBP APIS final rule published in the Federal Register on August 23, 2007, and will alleviate confusion within the industry and provide consistency for the public, since both agencies receive this information through eNOAD.

Based on comments, we removed our proposed NOD requirement. Our final rule adds three new data fields to the NOA information requirements: the MMSI number, whether the vessel is 300 GT or less, and whether a vessel's voyage time is less than 24 hours. The first two new data fields help us to better identify a vessel and more quickly determine if it is a smaller vessel which may not need safety exams. The third new field, in combination with the second, allows us to prioritize screening of NOAs from vessels 300 GT or less on a voyage of less than 24 hours; we allow those vessels to submit an NOA as late as 60 minutes before departure. The final rule removes the requirement for submission of consolidated NOAs. The final rule also requires foreign-flag commercial vessels 300 GT or less that transit 2 or more COTP zones (in addition to vessels carrying CDC) to submit NOAs, which the CBP APIS final rule does not require.

We have updated the NOA reporting burden in the collection of information portion of this report and the final rule. The addition of the three new NOA data fields is a program change to the collection of information.

## Baseline

- All U.S. and foreign vessels bound for or departing from ports or places in the United States (excluding U.S. recreational vessels);
- Vessels carrying or towing vessels controlling a barge or barges carrying certain dangerous cargo, and;
- U.S. commercial and all foreign vessels more than 300 GT, and all foreign vessels entering any port or place in the Seventh Coast Guard District, whose voyage time is 96 hours or more must submit an NOA 96 hours before departure when bound for ports or places in the United States; if the voyage time is less than 96 hours, a vessel owner or operator must submit a notice of arrival 24 hours before departure when bound for ports or places in the U.S.

NOA exemptions can be found in 33 CFR 160.203.

## NOA Costs

We estimate the costs associated with the addition of the three new fields to the NOA information requirements for U.S.- and foreign-flag vessel owners and operators already required to submit NOAs. We estimate it will take vessel owners and operators approximately 2 additional minutes to fill in the information for the three additional data fields; we did not receive public comments on this estimate. We estimate the average loaded wage for someone on board a vessel who would typically submit NOAD information to be \$31 per hour.<sup>13</sup> We include only a transmission cost of \$2 for foreign-flag vessels 300 GT or less that transit 2 or more COTP zones because this is a new requirement under the final rule. The addition of the three new NOA data fields is an NOA information requirement that all U.S. and foreign flag vessels coming from a foreign port or place must meet, unless otherwise exempted.

Foreign-flag vessels less than or equal to 300 GT are already required to submit an NOA under CBP's APIS final rule, which requires the use of a computer.<sup>14</sup> Our final rule will require these vessels to submit an NOA if they are transiting 2 or more COTP zones (which is not required by CBP's APIS final rule), so we add the transmission fee only to this group of vessels. Since these foreign-flag vessels are already submitting an NOA because they are coming from a foreign port or place, we subtract one from

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<sup>13</sup> A loaded labor rate is what a company pays per hour to employ a person, not the hourly wage. The loaded labor rate includes the cost of benefits (health insurance, vacation, etc.). The load factor for wages is calculated by dividing total compensation by wages and salaries. For this report, we used the Transportation and Materials Moving Occupations, Private Industry report (Series IDs, CMU2010000520000D and CMU2020000520000D. Using 2012 Q3 data, we divide \$23.68/\$15.98 to get the load factor of 1.481852315 or 1.48. We used the average mean hourly wage of cargo and freight agents and shipping/receiving/traffic clerks to obtain the average mean hourly wage of the person who would perform this duty since no one labor category was sufficient to determine the wage rate. The mean hourly wages are \$23.72 and \$18.27, respectively. The average of the two wages is about \$20.99 or \$21, multiplied by 1.48 for the load factor; we obtain \$31.08 or rounded to \$31 per hour for the loaded labor rate. See Appendices E and F. We obtained wage information from the Bureau of Labor Statistics website accessed 22 January 2013. See the BLS link for the wages applied above: ([http://www.bls.gov/oes/2011/may/naics3\\_483000.htm](http://www.bls.gov/oes/2011/may/naics3_483000.htm))

<sup>14</sup> The rule will not require a separate submission; the NOA information is inputted into one system therefore the submission of a CBP arrival manifest basically requires the same work as the submission of a CG NOA; as noted, there are some differences in the data required by CBP and USCG.

the number of trips made. There is no population of vessels affected by our final rule that would be required to purchase a computer or add Internet connectivity because it is required under CBP’s APIS rule. Under CBP’s APIS final rule, any vessel, regardless of size, coming from a foreign port or place must submit an NOA electronically, which requires the use of a computer. Therefore, we do not expect vessel owners and operators to purchase computers as estimated in the NPRM because the submission of NOAs is not new for the reasons explained above.

Based on updated NVMC data, Coast Guard’s Ship Arrival Notification System (SANS), and COTP data, we estimate the number of U.S.-flag vessels affected to be 3,430<sup>15</sup>, and the number of foreign-flag vessels affected to be 14,947. Combining these figures and removing duplicate information, we estimate that 2,500 of these vessels are 300 GT or less and coming from a foreign port based on COTP information. We also estimate that 500 of these vessels transit 2 or more COTP zones. We found the number of trips made annually to be constant as estimated in the NPRM for both populations of vessels. For U.S.-flag vessels, we use nine as the mean number of trips made annually to U.S. ports or places; for foreign-flag vessels, we use five for the mean number of trips made annually to U.S. ports or places.

For U.S. flag vessels coming from a foreign port or place and using nine for the mean number of trips made annually, the total number of trips made is 30,870 (3,430 vessels x 9 trips per vessel). We estimate the total number of additional hours to be 926 (30,870 trips x 0.03 hours or 2/60 minutes) hours. Multiplying the hours by the loaded labor rate (\$31 per hour), we estimate the cost for U.S. vessel owners and operators to comply with the NOA requirements to be \$28,706 annually. For the mean number of trips, we estimate the total present discounted value or cost to be between \$201,619 and \$244,868 at 7- and 3-percent discount rates, respectively, over the 10-year period of analysis.

**Table 3. U.S. Flag Vessels Ten-year Discounted Costs Using Mean Number of Trips**

<b>Trips per Vessel</b>	<b>Total Number of Trips</b>	<b>Cost (7 Percent)</b>	<b>Cost (3 Percent)</b>
<b>Mean (9)</b>	30,870	\$201,619	\$244,868

For the 14,947 foreign-flag vessels coming from a foreign port or place and using 5 for the mean number of trips made annually, we estimate the total number of trips to be 74,735. For foreign-flag vessels 300 GT or less that transit two or more COTPs, we estimate the total number of trips to be 2,000 (500 vessels x 4 trips). We estimate the total number of trips to be 76,735 using the mean number of trips. We estimate the non-discounted annual cost for all foreign-flag vessels to be \$104,502 [(14,947 x 5 trips x 0.03 hours x \$31 per hour=\$69,502) + (500 x 4 trips x 0.5 hours x \$31 per hour=\$31,000)] + (500 x 4 trips x \$2 transmittal fee=\$4,000). For the mean number of trips, we estimate the total present discounted value or cost to be between \$733,978 and \$891,423 at 7- and 3- percent discount rates, respectively, over the 10-year period of analysis.

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<sup>15</sup> This population is the number of current U.S. vessels coming from a foreign port or place annually that will be required to submit the three NOA fields since they are already required to submit NOAs, it is not a new population of vessels.

**Table 4. Foreign-Flag Vessels Ten-year Discounted Costs Using Mean Number of Trips**

<b>Trips per Vessel</b>	<b>Total Number of Trips</b>	<b>Cost (7 Percent)</b>	<b>Cost (3 Percent)</b>
<b>Mean (5)</b>	76,735	\$733,978	\$891,423

See Table 5 below for a summary of NOA costs for U.S.- and foreign-flag vessels.

It is our understanding that the federal government will need no additional time, personnel, or resources to gather, process, analyze, monitor, or respond to NOA data. Therefore, we have not included any governmental costs here.

**Table 5. Summary of NOA Costs of the Final Rule**

	<b>Discounted Costs Using Mean Number of Trips</b>		
	<b>10 Years (7 Percent)</b>	<b>10 Years (3 Percent)</b>	<b>Annualized</b>
<b>U.S.-flag Vessels</b>	\$201,619	\$244,868	\$28,706
<b>Foreign-flag Vessels</b>	\$733,978	\$891,423	\$104,502
<b>Totals</b>	\$935,597	\$1,136,291	\$133,208

We estimate the total annualized costs of the NOA requirements for both U.S. and foreign owners and operators to be about \$133,208 using the mean number of trips made to the U.S. annually. We estimate the total 10-year present value costs of the NOA requirements at a 7 percent discount rate for both U.S.- and foreign-flag vessel owners and operators to be about \$935,597 for the mean number of trips made to the U.S. annually.

The NOA portion of the final rule still exempts U.S. recreational vessels and foreign recreational vessels 300 GT or less.<sup>16</sup>

Concerning waivers and for this analysis, we do not assume that everyone who requests a waiver will receive one. However, the final rule applies broad exemptions or exceptions where there is justification for them. The waiver provision is in place so that the COTP can assess the validity of the request and take into consideration individual port factors that cannot be addressed at the national level, thereby providing an alternative for those vessels that do not meet the requirements for an exemption or exception. If the COTP denies a waiver request, the assumption is that specific factors pertaining to that vessel and COTP zone did not warrant a waiver. There are multiple ways to submit an NOA, including a third-party vendor who may send the NOA via onboard radio communications. The Coast Guard does not collect information for vessel owners that utilize shoreside facilities to submit arrival information. For the purpose of this RA, we assume affected vessel owners and operators will submit NOA information from on board their vessels.

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<sup>16</sup> A full list of exemptions for NOAD is contained in 33 CFR Part 160.204 and in the final rule. Readers can access the CFR online at <http://www.gpoaccess.gov/cfr/index.html>.

## NOA Benefits

The final rule revises NOA regulations in 33 CFR part 160 that are necessary to ensure receipt of comprehensive and timely information on vessels entering U.S. ports and transiting U.S. waters. The revision requiring electronic submissions will expedite processing of NOA information. Prompt receipt of this information about a vessel and its voyage, cargo, and persons on board, and the operational condition of its navigation equipment will assist us in—

- Protecting U.S. navigable waters;
- Preventing or responding to acts of terrorism;
- Providing sufficient time to permit advance vessel traffic planning prior to port entry (This allows the Coast Guard and other agencies to focus inspection/security resources on vessels that pose the greatest risk; and
- Creating a common operating picture and prioritizing our limited resources. (This allows the Coast Guard to filter through anomalous information by using manifest information from NOAs and by determining a vessel's location and identity using AIS; this creates a common operating picture of vessels in a waterway and allows us to evaluate and take a deterministic stance of potential threats in the waterway

Industry currently realizes benefits from NOA under the CBP APIS final rule. Under our final rule, we will require foreign-flag vessels 300 GT or less transiting 2 or more COTP zones to submit an NOA. As discussed in the NPRM Preliminary Regulatory Analysis, the Coast Guard Intelligence Coordination Center provided an intelligence analysis to other internal Coast Guard offices, as well as to DHS, indicating that terrorist organizations have the capability and the intention to conduct attacks on secondary targets possibly using small vessels. Small vessels still pose a security threat for waterborne primary targets, and may still serve as a delivery method for personnel and weapons in support of attacks on secondary targets. The addition of the MMSI number provides us with a unique identifier for each vessel that correlates NOA and AIS data and provides an accurate picture of location and verification of identity of the vessel. The addition of the field “300 gross tons or less” will allow us to prioritize the screening of vessels, schedule inspections, and establish security and safety zones. The addition of the field “voyage less than 24 hours” will allow certain vessels that meet an exemption, such as U.S.-flag vessels, to clarify that their voyage is less than 24 hours and eliminate the possibility of any delays or penalties that they may otherwise incur as a result of not submitting an NOA in a timely manner. The change to a 60-minute NOA timeframe for U.S. vessels 300 GT or less provides flexibility and relief to small entities that typically own and operate vessels of this size.

From a security perspective, vessels pose a risk in three ways: as a weapon for terrorists (e.g., intentionally colliding with another vessel or infrastructure component), as a means to transport personnel/materials for an attack, or as the target of an attack. The final rule helps focus the resources of the Coast Guard and other agencies to mitigate security risk across all three scenarios. Specifically, to determine if a vessel can be used as a weapon, a target, or as a transport vehicle, we have several tools at our disposal that assign risk based on valuable information contained in an NOA, such as crew and passenger information that CBP and the FBI use to identify persons or vessels that may pose a security risk to the United States. Theoretically, a vessel might lie about the identity of its passengers, however criminal sanctions may be imposed for submitting false information. Also, submitting false information

about the identify of passengers could result in expulsion of the vesels from U.S. waters and heavy fines. After receiving the NOA information, the data are placed into a database or matrix (depending on the tool being used). Points are assigned to each vessel and a vessel is then given a priority ranking based on its type and stated cargo. Above a certain threshold, we determine whether a vessel requires an escort to reduce the possibility of the vessel being used as a weapon, a target, or as a transport of suspicious persons or materials, such as WMDs or WMEs. If necessary, the vessel may be boarded or inspected to ensure that it meets international safety and security standards.

The essential elements of MDA include awareness, prevention, response, and consequence management. The acute recognition of the United States' waterside security vulnerabilities requires the Coast Guard to heighten its MDA. NOA and AIS are two key tools to heighten and extend our MDA beyond our territorial boundaries and allow us to track and monitor most vessels prior to their entry into U.S. territorial waters. Furthermore, given that terrorists will often seek to use the lowest-risk path, this rule adds requirements for warning similar to other modes of gaining access to the United States. Specifically, NOA data provides us awareness up to 96 hours in advance of arrival in order to investigate and analyze information on most vessels bound for the U.S. The 96-hour requirement is very important in allowing our Intelligence community, CBP and local COTPs to properly vet the vessel, cargo, crew and passengers to mitigate potential terrorist attacks and maritime security threats.

This information is shared with intelligence agencies and scrutinized well before these vessels reach U.S. shores, which provides us with ample time to prevent a maritime safety or security incident. The NOA requirement combined with AIS data forms a common operating picture in which vessel-specific movements in our ports and waterways can be monitored in real time, enabling us to filter data from non-compliant collection mechanisms such as radar, thereby enhancing our ability to rapidly detect, identify, and track suspicious vessels. This information is used as a decision-making aid by the Coast Guard field commanders and is also referenced in support of interagency and DoD efforts as it pertains to homeland security. Creating this common operating picture allows us an opportunity to prioritize our limited resources and meet mission requirements while maintaining MDA. Moreover, along with passenger, crew, and cargo information required by CBP, we can determine if a suspicious person is on board a vessel and, by adding AIS, we can determine the position of the suspicious vessel. We believe NOA and AIS combined will serve as a deterrent and will enhance Coast Guard interdiction capabilities, but will not completely eliminate the risk of maritime transportation incidents. For example, in 2011, Coast Guard Port State Control Officers targeted 8,909 vessels for security exams. During these exams, 237 deficiencies and 15 major control actions were issued for security related items, which enabled the Coast Guard to detect, identify, and deter suspicious vessels.

We know that smaller vessels and high-speed craft (commonly used as drug boats) pose a threat and are a major concern for the United States, which a DHS working group addressed in a report titled, "Small Vessel Security Strategy."<sup>17</sup> Smaller vessels pose a significant threat because terrorists seek to use them as weapons much like the vessel used in the U.S.S. Cole incident. We believe that smaller, quicker vessels can pose just as much of a threat as larger, slower vessels. This reasoning supports the applicability of the final rule to reduce the weight threshold down to 0 GT for foreign commercial vessels and to maintain the weight threshold of more than 300 GT for U.S. commercial vessels and 300 GT or less for U.S. commercial vessels coming from a foreign port. We chose to maintain the 300 GT-threshold for U.S. vessels because these vessels have vessel security plans and vetted crews unlike

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<sup>17</sup> <http://www.dhs.gov/xlibrary/assets/small-vessel-security-strategy.pdf>

foreign-flag vessels that do not have such security measures in place. Again, all foreign commercial vessels are currently required to submit arrival and departure manifests under the CBP APIS final rule. Not submitting an NOAD and not using an AIS device immediately makes these vessels suspect. NOA and AIS creates a common operating picture and enhances our ability to locate, identify, track, and deter suspicious vessels in real time, enabling us to filter data, regardless of the level of compliance. Furthermore, NOA and AIS allows us to discriminate threats from innocent vessels, enhances the Coast Guard's interdiction capabilities and allows the Coast Guard to better utilize its operational resources.

For the NPRM, we performed a break-even analysis for the NOAD portion. In the final rule, we align the NOA provisions with the CBP APIS final rule.<sup>18</sup> As a result, the NOA annualized costs are greatly reduced from approximately \$7,300,000 for the NPRM to \$72,000 for the final rule (values at a 7 percent discount rate). It would take very little risk reduction for the NOA portion of the final rule to break even.

As the Small Vessel Security Strategy states, small vessels pose a unique threat to the waterway system due to the large population of such vessels and their proximity to critical infrastructure, key resources, and military vessels. These vessels are readily vulnerable to potential exploitation by terrorists, smugglers of WMDs, narcotics, aliens, and other contraband, and other criminals. They also can be used to carry or deliver vessel-borne improvised explosive devices (VBIEDs) or waterborne improvised explosive devices (WBIEDs).

The risks these vessels pose (from the SVSS) “are difficult to manage because small vessels are not centrally registered, operators have not always demonstrated proficiency in small vessel operations, and the ability to screen or detect vessel-borne hazards is extremely limited. There is, moreover, a tradition and expectation among the large population of small vessel operators of largely unrestricted access to U.S. waterways.”

Below, we describe four attack scenarios which NOA may be beneficial in preventing. The advance notice of arrival gives the Coast Guard sufficient time to determine a potential threat and to position first responders accordingly. AIS further allows the Coast Guard the ability to track a vessel and show a vessel's specific position, which in turn gives the Coast Guard the ability to interdict a suspicious vessel before a potential attack occurs.

1. Any attack against any size passenger vessel—reductions from combinations of reduced likelihood or consequence of a successful attack. In this scenario, an attack against any size passenger vessel will yield an undetermined number of casualties based on the passenger vessel size and the type of device used in the attack.
2. Any attack against a ferry or cruise ship where a small VBIED is used—reductions from combination of reduced likelihood or consequence of a successful attack. In this scenario, an attack using a small VBIED could result in fewer casualties based on the size of the ferry or cruise ship and the number of passengers and crew on board at the time of the incident, from a small ferry with several hundred passengers to a large cruise ship with several thousand passengers onboard. Although a large cruise ship can carry many passengers, an attack from a small device may result in a few casualties.

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<sup>18</sup> <http://www.regulations.gov/#!documentDetail;D=USCG-2005-21869-0002>

3. Any attack against a ferry or cruise ship where a large VBIED is used—reductions from combination of reduced likelihood or consequence of a successful attack. In this scenario, the number of casualties resulting from an attack can vary greatly depending upon the size of the vessel involved in the attack, which can range from a small ferry with several hundred passengers to a large cruise ship with several thousand passengers onboard.
4. Any attack against a cruise ship where a large VBIED is used—reductions from combination of reduced likelihood or consequence of a successful attack. In this scenario, the potential for many casualties is greater due to the size of the device used in the attack and if the attack is successful against a large cruise ship with many passengers onboard. The potential for the number of casualties could be several thousand assuming the loss of all passengers on board.

Given the range of potential casualties under the scenarios described above on monetized consequences, the breakeven point would range from very minor to extremely minor. NOA may help prevent attacks from a man-operated portable device with just one fatality, which would require only one attack prevented every 88 years up to any attack with major consequences from a WMD.

### **3. Carriage of Automatic Identification System (AIS)**

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The Coast Guard published a final rule for the carriage of AIS under the statutory authority of the Maritime Transportation Security Act of 2002 (MTSA, Public Law 107-295, 116 Stat. 2064) for certain domestic vessels in VTS areas and vessels under SOLAS. AIS is a system that provides ships on a real-time basis with the latest information about the identity, voyage data, and maneuvers of other ships that are also equipped with the system. It allows ships to easily track, identify, and exchange pertinent navigation information with one another or ashore for collision avoidance, security, and VTS reporting. We expect the system to enhance situational awareness, permit more effective passing arrangements, and provide VTS areas with comprehensive traffic images. Through a combination of NOA and AIS, we believe that the final rule will assist the Coast Guard in its security initiative by enhancing MDA as these two elements communicate and share information.

#### **Baseline**

Vessel groups currently required to have AIS on board include:

- Under SOLAS, all tankers and passenger vessels, regardless of size, and any other vessel of 500 GT or more while on a domestic voyage (300 GT or more on an international voyage);<sup>19</sup>
- All commercial, self-propelled vessels of 65 feet or more in length in VTS areas or on a foreign voyage (except fishing and small passenger vessels);
- All passenger vessels certificated to carry more than 150 passengers for hire in VTS areas;
- All commercial towing vessels of 26 feet or more in length and 600 horsepower in VTS areas

#### **Population Affected**

The expanded applicability under the final rule for AIS is derived from Section 102 of MTSA (2002) and includes the following vessel groups:

- All self-propelled vessels of 65 feet or more in length engaged in commercial service, including fishing vessels;
- All towing vessels of 26 feet or more in length and more than 600 horsepower engaged in commercial service;<sup>20</sup>
- All self-propelled vessels engaged in dredging operations in or near a commercial channel or shipping fairway in a manner likely to restrict or affect navigation of other vessels;

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<sup>19</sup> See <http://www.navcen.uscg.gov/pdf/AIS/SOLAS.V.19.2.1-5.pdf>

<sup>20</sup> Commercial towing vessels used solely within a limited geographic area, used for assistance towing, or for pollution response do not have to carry AIS. The Coast Guard does not keep data on how many towing vessels meet these criteria.

- All self-propelled vessels engaged in the movement of CDC as defined in subpart C of part 160 (we published the NOA/CDC final rule in the Federal Register on September 28, 2010, 75 FR 59617) or flammable or combustible liquid cargo in bulk that is listed in 46 CFR 30.25–1, Table 30.25–1, and;
- All passenger vessels less than 65 feet in length certificated to carry more than 150 passengers

Based on a reevaluation of Coast Guard population data using our MISLE database to determine owner information, route and transit information, and the vessel requirements for AIS carriage, we estimate the total number of vessels affected by the AIS portion of this rule to be 5,922. These vessels would be required to install AIS beginning in 2012. We estimate the total number of U.S.-flag vessels affected to be 5,848. We estimate the total number of foreign-flag vessels to be 74, all of which are commercial fishing vessels 300 GT and less and 65 feet or more in length.

Table 6 presents the number of vessels by type that are affected by the final rule. This analysis considers the costs and benefits for U.S.-flag SOLAS and non-SOLAS vessels. It also provides cost estimates for foreign-flag vessels as a comparison.

**Table 6. Number and Types of U.S.-flag SOLAS and Non-SOLAS Vessels Affected by AIS Portion of Final Rule**

Vessel Type	U.S. Vessels Affected
<b>Fishing Vessels:</b>	
Undocumented (estimated)	64
Documented	2,842
<b>Total fishing vessels</b>	<b>2,906</b>
Freight Ship	247
Industrial vessel	220
MODU*	31
OSV**	151
Research	54
School	10
Tank Ship	35
Towing	1,429
Unclassified	326
Unknown	134
Passenger	288
Dredges or floating plants	17
<b>Total All Vessels</b>	<b>5,848</b>

\*Mobile Offshore Drilling Unit

\*\*Offshore Supply Vessel

## AIS Cost Analysis and Benefits

In this section, we present the national cost and benefits analyses for the AIS portion of the final rule for the affected populations. Again, we used the Coast Guard’s MISLE database to determine the number of

vessels that would be required to install AIS, in addition to the transit characteristics of vessels, to determine whether a vessel operates inside or outside of VTS areas.

The final rule will allow all owners or operators of fishing vessels or self-propelled vessels engaged in dredging operations in or near a commercial channel or shipping fairway in a manner likely to restrict or affect navigation of other vessels to carry a Class B AIS device, a less costly AIS alternative to the Class A AIS device. The final rule will also allow passenger vessels that do not operate in a VTS or Vessel Movement Reporting System (VMRS) area and are not capable of speeds in excess of 14 knots to install the less costly Class B AIS device. In addition, since we published the NPRM on December 16, 2008, the average cost of an AIS device has decreased. Based on publicly available information, we estimate the average cost of a Class A AIS device to be \$3,230. We estimate the average cost of a Class B AIS device to be \$700.<sup>21</sup> The cost analysis of the final rule is over a 10-year period (AIS implementation begins in 2012, or year 1, when initial year costs are incurred), and costs are discounted at 7- and 3-percent (per OMB Circular A-4) to their PV. The marine industry would incur costs beginning in 2012, and we expect benefits to accrue beginning in 2013, 1 year after installation.

## Unit Costs and Assumptions

We received several public comments that stated we underestimated both the cost of an AIS device and the costs of device installation. We obtained costs for both Class A and Class B AIS devices based on publicly available information and arrived at an average unit cost.<sup>22</sup> All AIS devices are stand-alone devices consisting of a main device and two external antennas for GPS and VHF communication. AIS devices do not require integration with other systems on board. However, the main device of each AIS, by design, allows for various interfacing options, primarily as outputs that can be used by other shipboard systems, such as radar, electronic charting systems, and multi-function displays. We did not include this interfacing option in our cost analysis because interfacing is not required by AIS and we do not have data or information to determine whether vessel owners and operators would make use of this functionality. As a result, we expect installation costs to be about the same as our estimate in the NPRM, in addition to annual maintenance costs. We did not receive comments specifically on our training estimates and, therefore, we continue to use the estimates as presented in the NPRM. Based on our estimates and assumptions in the NPRM, we use the values below as estimates per device, which includes the AIS device, graphical display, presentation software, and other equipment.

Other assumptions include:

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<sup>21</sup> The price points presented are averages based on publicly available cost information for Class A and Class B AIS devices. We realize that there is variability in the cost of an AIS device depending on the class and the manufacturer. With this in mind, we believe the averages are representative estimates of the costs for each device.

<sup>22</sup> <http://www.westmarine.com/webapp/wcs/stores/servlet/SiteSearch?storeId=11151&langId=-1&catalogId=10001&pageSize=10&beginIndex=0&sType=SimpleSearch&searchTermScope=3&Ns=Most+Popular%7C0&keyword=class+b+ais&searchBtn=>

[http://www.milltechmarine.com/AIS-Transponders\\_c\\_14.html](http://www.milltechmarine.com/AIS-Transponders_c_14.html)

<http://www.shinemicro.com/>

<http://www.psicompany.com/furuno-fa150-ais/>

- We assume a constant vessel population over the period of analysis, meaning the number of vessels entering service essentially equals the number of vessels retiring;
- We assume an 8-year life cycle for an AIS device as previously presented in MTSA;
- We assume the installation cost to be approximately \$969 per device (30 percent of the unit cost), incurred in the year of installation;
- We assume the annual maintenance cost to replace parts such as the keyboard or display screen to be \$250 per device, and;
- We assume the cost of training to use an AIS device to be \$110 per mariner (2 hours of training at \$55 per hour). We again estimate that an average of three mariners would need training per vessel. This cost is incurred during the first year of installation. This is a one-time cost. We assumed if a mariner leaves, the remaining trained mariners would train the incoming mariner as part of on-the-job-training in the course of normal duty hours and therefore would not result in an incremental or additional cost.

## Cost Analysis of AIS for U.S. Vessels

We estimate that the AIS portion of the final rule will affect 5,848 U.S. vessels. Based on the costs for Class A and Class B AIS devices presented above, we estimate the initial capital cost to U.S. vessel owners and operators to be \$11,493,850 (2,925 vessels x \$3,230/device for Class A devices) + (2,923 vessels x \$700/device for Class B devices).<sup>23</sup> During the initial year, we estimate the installation cost to be \$5,666,712 (5,848 vessels x \$969/device) and the training cost to be \$1,929,840 (5,848 vessels x 3 mariners/vessel x \$110/mariner). The operation and maintenance (O&M) cost is an annual cost incurred after the initial year and throughout the period of analysis. We estimate the O&M cost to be \$1,462,000 (5,848 vessels x \$250/device). The initial cost, which includes capital, installation, and training, is estimated to be \$19,090,402.

In addition, we estimate the cost of AIS initialization and voyage-specific information updates. AIS initialization is a one-time task when the device is turned on. AIS voyage-specific updates are ongoing and are a function of the number of vessel trips made. We estimate the total hours for initialization and updates for all AIS users to be 46,986 hours. Using \$31 as the loaded labor rate, we estimate the initial cost for both initialization and updates to be \$1,456,566 million (undiscounted, 46,986 hours x \$31 per hour). We estimate the total initial cost to vessel owners and operators to install and implement AIS, including initialization and updates, to be \$20.5 million (undiscounted, \$19,090,402 + \$1,456,566). We estimate the cost for voyage-specific updates to be \$1.4 million annually (undiscounted, 44,066 hours to update x \$31 per hour = \$1,366,046).

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<sup>2323</sup> We based our decision of whether to require Class A or Class B devices primarily on the vessels' operating area (vessels not in VTS waters), speed (under 14 kts), and required capability (meaning no interfacing will be required). We provide a more detailed discussion in the preamble. Based on the requirements of the final rule, owners and operators of fishing vessels, dredges, derricks, and cranes that do not operate in VTS or VMRS areas and passenger vessels that are not capable of speeds in excess of 14 knots be permitted to install Class B AIS devices. Based on MISLE information, we are unable to determine the number of passenger vessels that are capable of this speed. Therefore, our cost estimate assumes Class A AIS device installation for these vessels, which results in a cost overestimate for the rule. We present this as a cost uncertainty below.

The installation of an AIS device on board the required vessels calls for a new collection of information. The collection will involve two response categories, one for initialization and another for voyage-specific entry. Each vessel will require a one-time initialization response, which we estimate will take 20 minutes per vessel, and a voyage-specific response, which we estimate will take 5 minutes and is based on the mean number of voyages a given vessel makes annually for certain domestic vessel classes. The estimate of 5 minutes is based on subject matter expert information. We did not receive public comments on this estimate, so we did not change the primary estimate from the NPRM. Updates apply only to Class A AIS units, not Class B AIS units. Class A AIS vessels, known as workboats, include Offshore Supply Vessels and towing and fishing vessels. These vessels make approximately 164 trips per year. These voyages do not require NOAs because they include pier-to-pier, port-to-pier, or pier-to-port transits within the same COTP zone. Therefore, we do not apply this value to the NOA portion of the final rule. Moreover, Class B AIS vessels do not engage in voyage-specific updates. The number of voyages made per vessel for other vessel classes has remained fairly constant, and we did not receive public comments on this particular data element. Therefore, we retained the estimates in the NPRM that domestic vessels make approximately nine mean voyages per year and foreign-flag vessels make approximately five mean voyages per year.<sup>24</sup>

We estimate the total present discounted value or cost of the AIS portion of the final rule to U.S. vessel owners and operators to be between \$45.0 and \$53.4 million over the 10-year period of analysis at 7- and 3-percent discount rates, respectively. Table 7 presents a summary of the costs incurred for U.S. vessel owners and operators for the AIS portion of the final rule.

**Table 7. Summary of Total National AIS Cost of Final Rule for U.S.-flag Vessels (7- and 3-percent Discount Rates)**

Year	Capital Cost	Installation Cost	Training Cost	O&M Cost	Initialization and Updates	Total Cost*	PV Cost (7%)	PV Cost (3%)
1	\$11,493,850	\$5,666,712	\$1,929,840	-	\$1,456,566	\$20,546,968	\$19,202,774	\$19,948,513
2	-	-	-	\$1,462,000	\$1,366,046	\$2,828,046	\$2,470,125	\$2,665,705
3	-	-	-	\$1,462,000	\$1,366,046	\$2,828,046	\$2,308,528	\$2,588,063
4	-	-	-	\$1,462,000	\$1,366,046	\$2,828,046	\$2,157,503	\$2,512,682
5	-	-	-	\$1,462,000	\$1,366,046	\$2,828,046	\$2,016,358	\$2,439,497
6	-	-	-	\$1,462,000	\$1,366,046	\$2,828,046	\$1,884,446	\$2,368,444
7	-	-	-	\$1,462,000	\$1,366,046	\$2,828,046	\$1,761,165	\$2,299,460
8	-	-	-	\$1,462,000	\$1,366,046	\$2,828,046	\$1,645,949	\$2,232,486
9	\$11,493,850	\$5,666,712	-	-	\$1,366,046	\$18,526,608	\$10,077,247	\$14,199,102
10	-	-	-	\$1,462,000	\$1,366,046	\$2,828,046	\$1,437,635	\$2,104,332
<b>Total</b>	-	-	-	-	-	<b>\$61,697,944</b>	<b>\$44,961,729</b>	<b>\$53,358,283</b>

Totals may not sum due to independent rounding.

We estimate annualized cost for the AIS portion of the final rule to U.S.-flag vessel owners and operators to be \$6.4 million using a 7-percent discount rate.<sup>25</sup>

<sup>25</sup> We used 10 as the value to represent the number of periods over which we annualized costs of the final rule during the 10-year period of analysis.

## Cost Analysis of AIS for Foreign Vessels

We estimate that the AIS portion of the final rule will affect 74 foreign-flag vessels, comprised solely of commercial fishing vessels. Using the same assumptions that we used for U.S.-flag vessels, we estimate that the implementation cost of the AIS portion of the final rule to foreign-flag vessel owners and operators to be between \$0.59 and \$0.70 million (PV) over the 10-year period of analysis, at 7- and 3-percent discount rates, respectively including initialization and updates. We estimate the initial AIS cost for foreign-flag vessel owners and operators to be \$0.34 million. We estimate annualized costs to be \$0.084 million at both discount rates.

## Cost Analysis of AIS for the Federal Government

It is our understanding that the federal government will need no additional time, personnel, or resources to gather, process, analyze, monitor, or respond to AIS data. Therefore, we have not included any governmental costs here.

## Total AIS Costs of the Final Rule

We estimate the total initial AIS cost of the final rule to both U.S.- and foreign-flag vessel owners and operators to be \$21.0 million. We estimate the total present discounted value or cost to all vessel owners and operators to be between \$46.0 and \$54.1 million over the 10-year period of analysis, at 7- and 3-percent discount rates, respectively. We estimate the total annualized cost of the AIS portion of the final rule to all affected vessel owners and operators to be \$6.5 million at a 7-percent discount rate. Table 8 presents a summary of the total AIS costs of the final rule for both U.S.- and foreign-flag vessel owners and operators.

**Table 8. Summary of Total AIS Costs of the Final Rule to U.S.- and Foreign-flag Vessel Owners (7- and 3-percent Discount Rates) (\$Millions)**

Discount Rates	Total Discounted AIS Costs		
	U.S.-flag Vessels	Foreign-flag Vessels	Total Cost
7 percent discount rate	\$45.0	\$0.59	\$46.0
3 percent discount rate	\$53.4	\$0.70	\$54.1

Totals may not sum due to independent rounding.

## AIS Benefits

OMB Circular A-4 suggests that we present quantifiable benefits whenever possible.<sup>26</sup> We expect benefits of this final rule to include improved security, safety and environmental protection. The Coast Guard believes that this final rule will enhance maritime and navigation safety, and will strengthen maritime and national security. We received several public comments concerning the benefits of AIS in general and have addressed these comments in the preamble of the final rule. See the “Discussion of Comments” section of the final rule for our responses to public comments.

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<sup>26</sup> Readers can view the section on ancillary benefits on page 26 of the Circular online at <http://www.whitehouse.gov/omb/circulars/index.html>.

The final rule provides both quantifiable and non-quantifiable benefits. Non-quantifiable benefits exist in the form of enhancements to homeland security provided by expanded AIS carriage. These non-quantifiable benefits include improved information and enhanced communications, which lead to a superior level of MDA. Improving MDA will also result in improvements to maritime and navigation safety. We assess additional improvements to safety and environmental protection quantitatively, given the existence of historic casualty data from which to develop such estimates. From the casualty history, we can assess the mitigation of fatalities, injuries, property damage, and environmental impacts as a result of oil spills from casualty incidents. The final rule also supports other Coast Guard missions such as marine safety and security and maritime mobility.

We based the identification of quantifiable safety benefits on a review of marine casualty data culled from both the Marine Safety Management System (MSMS) database and its successor, the MISLE database.<sup>27</sup> Specifically, we retrieved marine casualty reports from these databases for the 8-year period from 1996 to 2003, inclusive, that applied to the population of vessels affected by the final rule (we also examined casualty cases for the period 2004-2009, and we present our findings later in this section; we also reviewed casualty cases for 2010 and determined three cases would have benefitted from AIS onboard).<sup>28</sup> The population of cases from 2004-2010, described above, are distinct from the population we evaluated during the previous 2003 MTSA AIS rulemaking, and includes only those vessels involved in marine casualties outside of a VTS area. We then evaluated the reports to identify those casualties that were most likely to be affected by AIS carriage. Coast Guard officers with significant experience at sea, deck watch officers, marine casualty investigators, transportation specialists, and economists conducted this identification.

### ***Screening of Marine Casualty Data***

In the NPRM, we queried MSMS (1996-2001) and MISLE (2002, 2003) to obtain casualty reports for all collisions, allisions, and groundings involving U.S. commercial vessels, and developed a list containing approximately 10,500 casualty reports for the period 1996-2003, inclusive. Collisions, allisions, and groundings are the most likely casualty types to be affected by AIS carriage because they involve navigation and situational awareness, and often occur as a result of insufficient or inaccurate information regarding the behavior and intentions of other vessels.

Table 9 below shows the comparison between quantified costs and benefits for AIS.

**Table 9. Comparison of Annualized Quantified Costs and Benefits of AIS for Final Rule for U.S. Vessels (7-percent Discount Rate)**

AIS Cost (\$millions)	\$6.4
AIS Monetized Benefits (\$millions)	\$3.6
AIS Pollution Avoided (unmonetized)	12 barrels of oil

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<sup>27</sup> For casualty reports through December 2001, we used the Coast Guard’s MSMS database to retrieve vessel casualty data as well as other vessel information. Data from this database were back-loaded into MISLE after this date and MISLE is now the primary database for vessel information retrieval.

<sup>28</sup> The three casualty cases from 2010 did not produce injuries, deaths, or pollution. The case ID numbers are: 3762970, 3827930, and 3851194, also included on disk.

For the final rule, we also examined nearly 6,000 additional marine casualty cases for the period 2004-2009, inclusive, using the same database and criteria to determine if any incidents could have benefitted from an onboard AIS unit (See Appendix C). We also examined over 800 casualty incidents for 2010.

Using the same process used for the NPRM, we then filtered this list to remove:

- Duplicate casualty reports;
- Casualties involving vessels where the final rule will not apply, and;
- Casualties involving vessels already required to carry AIS under the previous rulemaking, including those casualties occurring in VTS areas.

Our filtering process allowed us to focus on approximately 5,500 casualties. We further refined the list by determining whether there was evidence of impaired situational awareness, which we deemed to be a precursor to many casualties. Many marine casualties are a result of inadequate or flawed situational awareness on the part of vessel operators. The primary casualty prevention feature of AIS is its ability to minimize the impacts of such barriers to situational awareness as—

- Limited visibility (visual and/or radar);
- Confusion regarding location or presence of other vessels;
- Confusion regarding intentions (including course and speed) of other vessels;
- Inability to monitor location, course, speed, or intentions of other vessels; and
- Conflicting or erroneous identification of other vessels.<sup>29</sup>

During this initial review, we also evaluated the casualty reports to exclude casualties in which—

- AIS would have had no effect on the casualty, including factors such as—
  - Unexpected current or wind, or sudden changes;
  - AIS would not provide substantial additional information beyond that already available to the vessel operators, as with a close-in maneuvering situation;
  - Human error or gross negligence, misconduct, or violation of a law or regulation that likely would not have been mitigated by AIS, and;
  - Casualties not related to AIS capabilities (e.g., vessel striking a submerged object).

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<sup>29</sup> It is very difficult for vessel operators to determine what information is conflicting or erroneous when making a passing arrangement at sea, particularly in congested waters. Unlike bridge radiotelephones which do not have phone numbers or caller IDs, AIS provides not only caller ID, but it has the capability to locate which vessel is calling and provides a vessel operator the ability to specifically identify and call on another vessel. Without AIS technology, this is not possible.

- One of the vessels directly involved in the casualty would not be an AIS carrier under the final rule due to size (e.g., a fishing vessel less than 65 feet in length) or service (e.g., a pleasure craft); and
- There was insufficient information in the casualty report to make a definitive determination (e.g., a casualty report stating only that “two vessels collided during a meeting situation. No pollution or injuries.”)

After we screened casualties to exclude these elements, we performed an in-depth analysis of all available MSMS and MISLE casualty documentation to confirm that AIS would have significantly enhanced situational awareness to the point that the casualties would likely have been prevented.

Some of the guidelines we used were the following:

- Was there sufficient distance and/or time, prior to becoming *in extremis*, for vessel operator(s) to act on information provided by AIS?
- Were radio communications between vessels poor or non-existent?
- Was visibility between vessels restricted by weather, geography, or other factors?
- Was there confusion regarding the presence, identity, location, or course/speed of other vessels, or would AIS have provided additional information that could have made the vessel operator act differently (e.g., visual and radar picture did not indicate the presence of other vessels that would have appeared on AIS)?

To conduct our final analysis, we made the following assumptions:

- AIS is properly installed and operational in accordance with applicable requirements;
- AIS would meet, but not exceed, the minimum guidelines of the requirements (e.g., AIS is text-only and not displayed with an electronic chart overlay or other options of more advanced AIS models);
- AIS would have superior reception to VHS radio communications (per Coast Guard subject matter experts);
- Unlike radar, AIS would “see” around waterway bends;
- Vessel operators would use the AIS information;
- AIS would alleviate the problem of misidentified vessels on radar or radio communications;
- Specific length of tow(e.g., tow over 200 feet) would not be included in AIS information as would vessel characteristics;

- AIS-equipped vessels would operate AIS while underway, anchored, and, in the case of towing vessels, while pushed up to the bank, and;
- Vessel operators would make timely input of, and revision to, relevant AIS data fields (e.g., cargo, draft, etc.).

The final casualty selection step was a confirmation that all relevant vessels met the applicability criteria of the final rule and that the benefit of casualty had not been claimed under previous rules.

From our NPRM analysis for 1996 to 2003, we determined that AIS most likely would have prevented 64 casualty incidents that caused 14 injuries and 5 fatalities. We present a list of these cases and the associated injuries, fatalities, and pollution in Appendix A. From our analysis of casualty cases from 2004-2009, and using the same criteria as described above, we found an additional 18 casualty incidents where we believe AIS would have been helpful in preventing an incident from occurring had the vessels involved had AIS on board. From these cases, AIS most likely would have prevented an additional 8 injuries and 1 fatality. Including 2010 data, there was a combined total of 85 cases; the average annual value of the 21 injuries and 6 deaths that occurred in these cases, based on a VSL of \$9.1 million, is about \$4.1 million, undiscounted.

We used the identified casualty incidents to develop an average annual historical rate of AIS-preventable marine casualties for the affected vessel population, which we use as the basis of our benefit analysis. An explanation of our methodology is as follows:

Fatalities and Injuries: The team evaluated fatalities and injuries on board the domestic vessels as a result of the AIS-preventable casualties. We again use a VSL of \$9.1 million.<sup>30</sup>

Pollution: We categorized all pollution incidents resulting from AIS-preventable casualties as oil spills. We used the volume of oil spilled (converting to barrels) contained in the casualty reports. Although we did not find cases with hazardous substances involved, there exists a potential for the spillage of hazardous substances in addition to oil.

### ***Calculation of Benefit<sup>31</sup>***

In our analysis of casualty cases, we assume this rule will prevent the casualty incident in its entirety and we used cases where AIS would have been most effective; we did not use a portion or a partial amount of the casualty case. For the cases considered in this analysis in support of the final rule, we used casualty cases that occurred during the period 1996-2010 inclusive of the endpoints.<sup>32</sup>

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<sup>30</sup> <http://www.dot.gov/policy>; see also <http://www.dot.gov/sites/dot.dev/files/docs/DOT%202013%20Signed%20VSL%20Memo.pdf>

<sup>31</sup> Benefits for AIS would still accrue as presented in this analysis regardless of the infrastructure in place because of the ship-to-ship nature of AIS and the capacity of Coast Guard resources to receive shipboard information.

<sup>32</sup> Using the criteria for examining casualty cases for this benefit analysis, the Coast Guard analyzed year 2010 casualty cases and determined that three cases would have benefitted from having AIS on board. These three cases produced no injuries, deaths, or pollution, and had total property damage of \$68,000.

All of the cases we reviewed involved minor, moderate, and serious injuries. We did not find any cases that contained critical or severe injuries. We based our injury valuations on current Department of Transportation (DOT) guidance and practices that present injury valuations (Abbreviated Injury Scale) as a fraction of the willingness to pay (WTP) value of a fatality averted; in this case, the VSL of \$9.1 million per fatality. Based on this VSL, it follows that a minor injury is then valued at \$27,300, a moderate injury is valued at \$427,700, and a serious injury is valued at \$955,500.<sup>33</sup> Of the 64 cases between 1996 and 2003 that we included in our analysis where AIS would have been beneficial, we found over the 8-year period a total of 14 injuries and 5 fatalities, with a total value of approximately \$48.0 million. We divided by 8 (number of years in the data set) to obtain annualized values for our benefit values. Using \$9.1 million for the VSL, the average value or benefit per year is approximately \$6.0 million. See Appendix B for further details. Table 10 shows the Abbreviated Injury Scale and WTP used in this analysis.

**Table 10. Abbreviated Injury Scale and Percent of Willingness to Pay (WTP)**

AIS Level	Description	Percent of VSL	VSL Value
1	Minor	0.30%	\$27,300
2	Moderate	4.70%	\$427,700
3	Serious	10.50%	\$955,500
4	Severe	26.60%	\$2,420,600
5	Critical	59.30%	\$5,396,300

Starting in 2006, MISLE began using the Abbreviated Injury Scale (AIS) to classify the severity of injuries. The AIS scale has values ranging from 1 for minor through 6 for fatality. Table 11 shows the classification of injuries by AIS categories.

**Table 11. Classification of Injuries by AIS Categories**

Category	MISLE Description	MISLE Examples
Minor	The injury is minor or superficial. No professional medical treatment was required.	Minor/superficial scrapes (abrasions), minor bruises, minor cuts, digit sprain, first degree burns, minor head trauma with headache or dizziness minor sprain/strain
Moderate	The injury exceeds the minor level, but did not result in broken bones (other than fingers, toes or nose), loss of limbs, severe hemorrhaging, muscle, nerve, tendon or internal organ damage. Professional medical treatment may have been required. If so, the person was not hospitalized for more than 48 hours within 5 days of injury.	Broken fingers, toes, or nose, amputated fingers or toes, degloving of fingers or toes, dislocated joint, severe sprain/strain, second- or third-degree burns covering 10% or less of body, herniated disc

<sup>33</sup> See additional details at, [http://www.dot.gov/sites/dot.dev/files/docs/Value\\_of\\_Life\\_July\\_29\\_2011.pdf](http://www.dot.gov/sites/dot.dev/files/docs/Value_of_Life_July_29_2011.pdf). As an example, case number 93014220 had one injury that we classified as moderate. Contained in DOT memoranda and guidance, the value of a moderate injury is .047 of a fatality with 1.00 representing the value of a fatality. To arrive at the value of a moderate injury, we multiply .047 by \$9.1 million to get \$427,700. We then sum the value of all of the cases to obtain a total value for injuries and fatalities.

Serious	The injury exceeds the moderate level and requires significant medical/surgical management. The person was not hospitalized for more than 48 hours within 5 days of injury.	Broken bones other than fingers, toes, or nose, partial loss of limb, degloving of entire hand/arm or foot/leg, second- or third-degree burns covering 20-30% of body, bruised organs
Severe	The injury exceeds the moderate level and requires significant medical/surgical management. The person was hospitalized for more than 48 hours of injury and, if placed in intensive care, was in intensive care for less than 48 hours.	Internal hemorrhage, punctured organs, severed blood vessels, second- or third degree burns covering 30-40% of body, loss of entire limb
Critical	The injury exceeds the moderate level and requires significant medical/surgical management. The person was hospitalized and in intensive care for more than 48 hours within 5 days of injury.	Spinal cord injury; extensive second or third degree burns; concussion with several neurological signs; severe crushing injury; second/third degree burns covering over 40% or more of body; severe/multiple organ damage

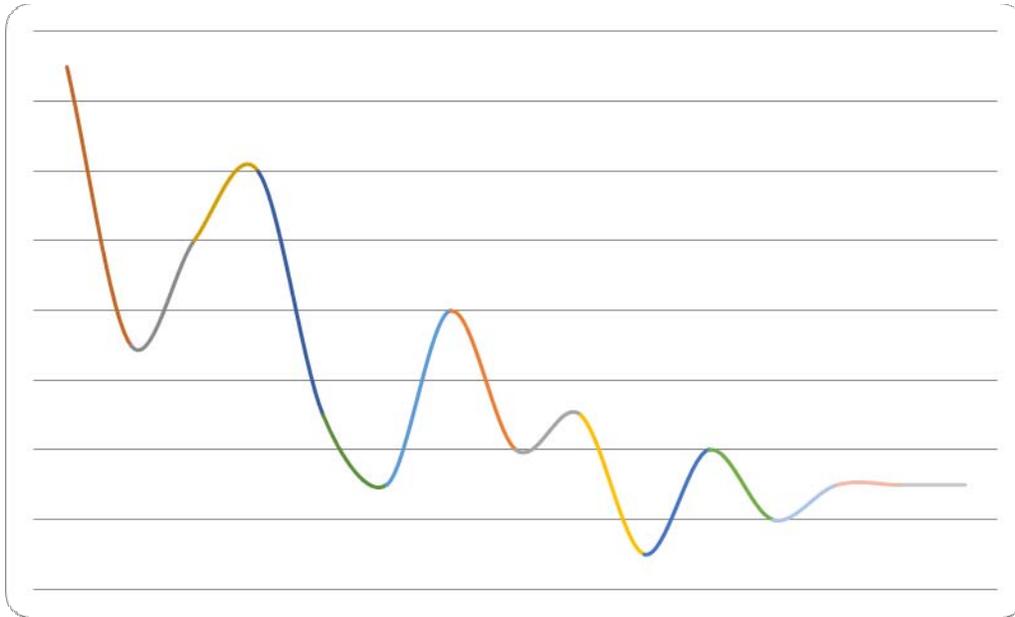
For the additional 21 casualty cases included in our analysis (from 2004-2010) where we determined that AIS would have been beneficial, we found over the 7-year period a total of 7 injuries and 1 fatality, with a total value of approximately \$9.7 million, or an average of approximately \$1.6 million per year. We estimate the total benefit (injuries and fatalities) derived from marine casualty cases between 1996 and 2009 (2010 cases did not produce benefits since there were no injuries, deaths, or pollution, only property damage) for the AIS portion of the final rule to be between \$25.1 and \$31.2 million (VSL = \$9.1 million/life) at 7- and 3-percent discount rates, respectively, over the 10-year period of analysis. We estimate the total average annualized benefit to be \$3.6 million using 7- and 3-percent discount rates. See Tables 12 and 13 for further detail. We separated the two casualty periods to highlight the reduction in cases for the period 2004-2010 that may have benefitted from having AIS onboard, which may be attributed to vessel owners and operators having AIS onboard voluntarily. We are unable to present marginal benefits by each AIS provision because multiple vessels of different classes affected by each provision can be involved in the same casualty incident, precluding us from attributing the marginal benefit to a particular vessel class.

We then discounted the annual average over the 10-year period of analysis at 7- and 3-percent discount rates, respectively, to obtain the total discounted benefit of the AIS portion of the final rule. As presented in the NPRM, since we assume the installation of AIS will occur in year one, benefits will accrue beginning in year two. See Tables 12 and 13 for further detail.

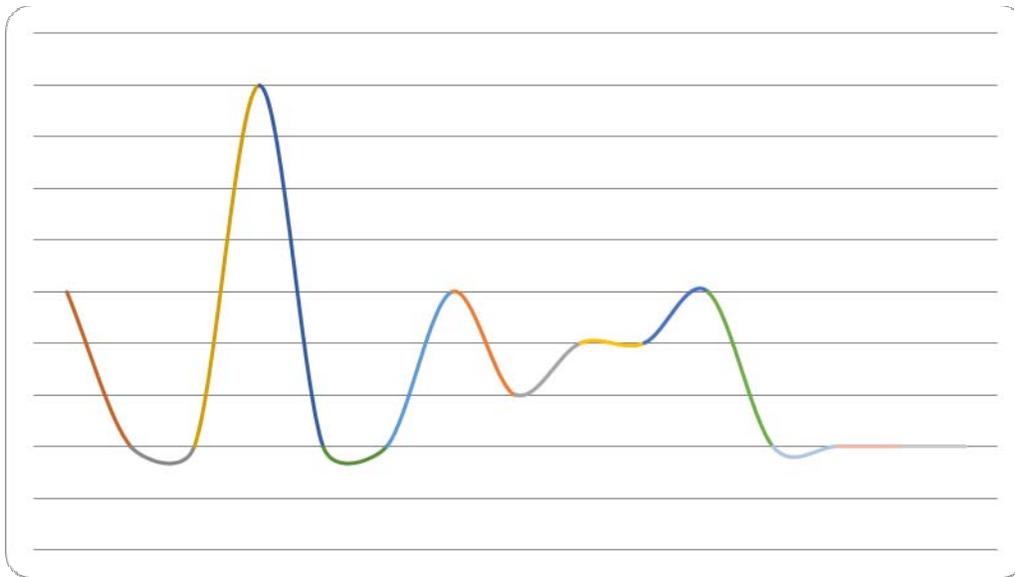
### **Baseline Accident Data, 1996-2010**

Based on MISLE data, over the 15-year casualty analysis period (including 2010), the baseline number of accidents averaged approximately six per year. The number of injuries and fatalities over the casualty analysis period averaged approximately two and less than one per year, respectively. See Tables 12, 13, and 14 below.

**Table 12. Number of Vessel Incidents, 1996-2010**



**Table 13. Number of Injuries, 1996-2010**





cause of an accident or assign partial benefits. These cases were excluded from our analysis of benefits. By using this process and reasoning, we have excluded many cases for which there might (or even likely) would have been benefit but for which there was some uncertainty. Appendix G includes the descriptions of four sample accidents (Casualty Case Reviews) which we believe AIS would have had 100 percent effectiveness in preventing.

We estimate the total benefit or barrels of oil not spilled for all 85 casualty cases between 1996-2010 to be between 85 and 106 barrels over the 10-year period of analysis at 7- and 3-percent discount rates, respectively. We expect annualized unmonetized benefits to be approximately 12 barrels of oil not spilled at 7- and 3-percent discount rates.<sup>35</sup> See Tables 15 and 16 below.

**Table 15. Summary of Present Value Benefit of AIS (7-percent Discount Rate)**

Year	Benefit	PV Benefit (Death, Injury)	Oil Spills (bbls)
1	--	--	--
2	\$4,121,650	\$3,600,009	12
3	\$4,121,650	\$3,364,494	11
4	\$4,121,650	\$3,144,387	11
5	\$4,121,650	\$2,938,679	10
6	\$4,121,650	\$2,746,429	9
7	\$4,121,650	\$2,566,756	9
8	\$4,121,650	\$2,398,838	8
9	\$4,121,650	\$2,241,905	8
10	\$4,121,650	\$2,095,238	7
<b>Total</b>	<b>\$37,094,850</b>	<b>\$25,096,736</b>	<b>85</b>

Note: Barrels of oil are discounted at 7 percent. Totals may not sum due to independent rounding.

**Table 16. Summary of Present Value Benefit of AIS (3-percent Discount Rate)**

Year	Benefit	PV Benefit (Death, Injury)	Oil Spills (bbls)
1	--	--	--
2	\$4,121,650	\$3,885,050	13
3	\$4,121,650	\$3,771,894	13
4	\$4,121,650	\$3,662,033	12
5	\$4,121,650	\$3,555,371	12
6	\$4,121,650	\$3,451,817	12
7	\$4,121,650	\$3,351,279	11
8	\$4,121,650	\$3,253,669	11
9	\$4,121,650	\$3,158,902	11
10	\$4,121,650	\$3,066,895	10
<b>Total</b>	<b>\$37,094,850</b>	<b>\$31,156,909</b>	<b>106</b>

Note: Barrels of oil are discounted at 3 percent. Totals may not sum due to independent rounding.

<sup>35</sup> In the analysis for the NPRM, we provided quantified benefits of barrels of oil not spilled as a result of AIS requirements but we did not monetize the avoided pollution damage and clean-up costs associated barrels of oil not spilled. We continue to use this analytical framework to maintain consistency between the NPRM and final rule analysis.

The baseline data show that less than one spill per year occurred on average over the 15-year casualty analysis period where AIS may have been beneficial in preventing the incident. See Table 17 below.

**Table 17. Number of Oil Spills, 1996-2010**

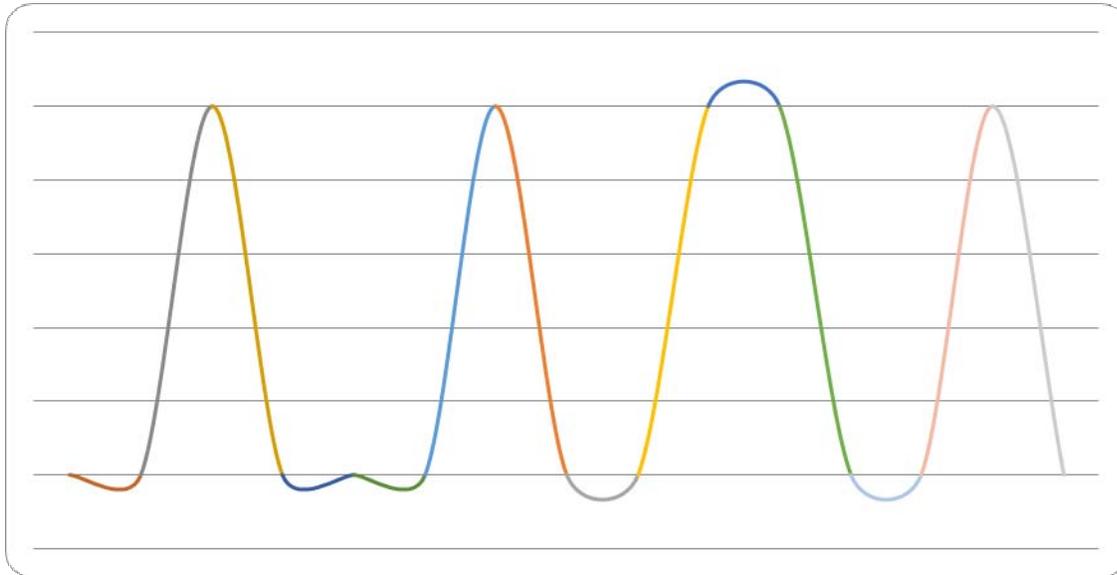
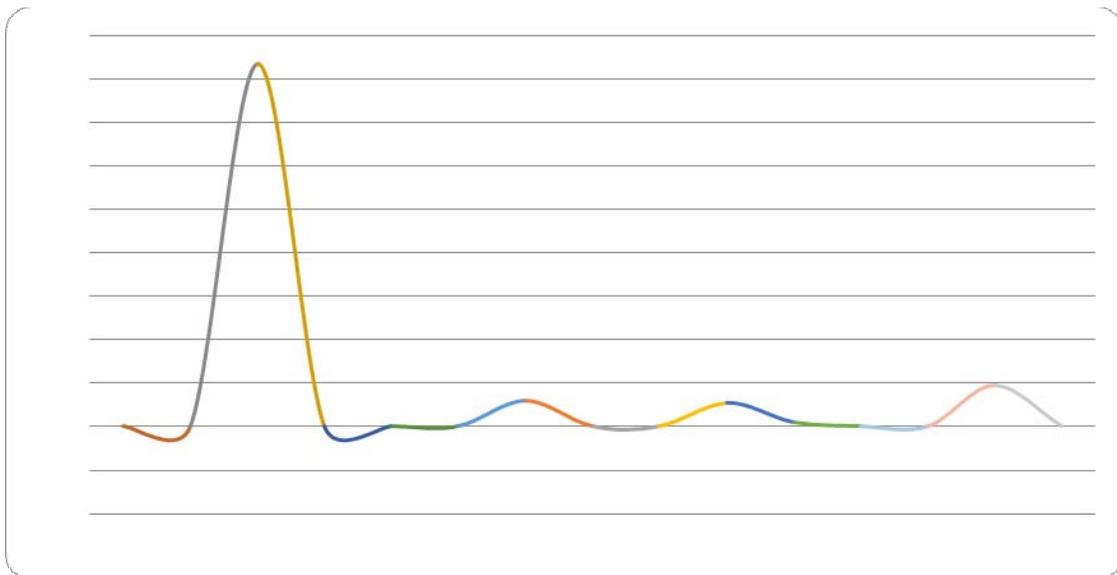


Table 18 shows the volume of oil spilled during the 15-year casualty period. One case accounted for 167 of the 211 total barrels of oil spilled (approximately 79 percent) over the 15-year casualty period, undiscounted (see Appendices A and C).

**Table 18. Volume of Oil Spilled (barrels), 1996-2010**



We attribute the low benefit values to the low number of casualty cases that will presumably be affected by AIS outside VTS areas.

### ***Damages***

The 64 cases for the period 1996-2003 yielded approximately \$3.0 million in property damage, or \$375,000 annually. The additional 18 cases for the period 2004-2010 yielded an adjusted damage amount of approximately \$2.1 million, or \$323,000 annually.<sup>36</sup>

With both data periods combined, and including cases from 2010, the total property damage for all 85 cases used in our benefit analysis was approximately \$5.1 million, or an annual average of \$350,000, undiscounted.

### ***Improved Information***

Mariners and Coast Guard personnel will enjoy improved real-time information as a result of AIS. While we quantify this benefit above, there are further benefits to having reliable and timely information beyond casualty avoidance. For example, the Coast Guard will also be able to target vessels that operate in a dangerous manner and identify inspected vessels operating beyond the scope of their certificate, which should improve safety without compromising the efficiency of responsible operators.

## **AIS Non-Quantified Benefit Analysis**

### ***Improved Communications***

AIS will provide vessel information in an automated mode, thereby reducing misunderstood voice communications that impose a burden to vessel operators. Silent data transmissions coupled with accurate visual displays will allow vessel operators to operate more efficiently.

### ***Reduced Near-collisions***

It is not possible to determine the number of casualties that are narrowly avoided, because only those accidents meeting a certain level of severity are reported to the Coast Guard. Near collisions or allisions disrupt shipboard operations, cause undue stress, and slow the flow of traffic in the waterway. AIS will help alleviate some of this burden because of the nature of its operation; it extends mariners' range of situational awareness and provides a visual indication of targets miles before they would be detected by the human eye, or in areas (e.g., around a bend) not capable of being seen or detected with other equipment such as radar.

Some public comments to the NPRM indicated a concern that AIS would divulge fishing "hot spots" thereby causing congestion in a specific area. Based on information from the Office of Navigation Systems, we do not believe this will occur. AIS would augment other signals currently required by fishing vessels when engaged in commercial fishing operations. These signals currently inform other

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<sup>36</sup> Damage amounts adjusted using the CPI-U Index and 2007 as the base year.

vessels that fishing operations are underway and the use of AIS in no way indicates whether a particular fishing area is a “hot spot.”

### ***Maritime Domain Awareness (MDA)***

A major tenet of The Strategy for Maritime Security (HSPD13, 2005) is to have effective MDA:

*"It is the policy of the United States to take all necessary and appropriate actions, consistent with U.S. law, treaties and other international agreements to which the United States is a party, and customary international law as determined for the United States by the President, to enhance the security of and protect U.S. interests in the Maritime Domain<sup>37</sup>..."*

–Presidential Directive . Maritime Security Policy, December 21, 2004

The essential elements of MDA include awareness, prevention, response, and consequence management. The acute recognition of the United States’ waterside security vulnerabilities requires the Coast Guard to heighten its MDA. NOA and AIS are two key tools to heighten and extend our MDA beyond our territorial boundaries and allow us to track and monitor most vessels prior to their entry into U.S. territorial waters. Furthermore, given that adversaries will often seek to use the lowest-risk path, the final rule adds requirements for warning other modes of accessing the United States. Specifically, NOA provides us with awareness up to 96 hours in advance so that we can investigate and analyze information on most vessels bound for the United States. This information is shared with other intelligence agencies and scrutinized well before these vessels reach our shores, which provides us with ample time to prevent a maritime incident. AIS provides us with awareness and facilitates response prior to vessel arrivals to carry out such actions as boardings or escort services. AIS also improves our ability to identify non-compliant vessels that choose not to broadcast through AIS either by turning off the AIS unit or not carrying one at all; a vessel operator that turns off an AIS device immediately becomes suspicious to authorities such as Port Authorities, VTS operators, Coast Guard assets, and by other vessel operators in the waterway . The NOA requirement combined with AIS forms a common operating picture in which vessel-specific movements in our ports and waterways can be monitored in real time, enabling us to filter data from non-compliant collection mechanisms such as radar, thereby enhancing our ability to rapidly detect, identify, and track suspicious vessels. This information is used as a decision-making aid by the Coast Guard field commanders and is also referenced in support of interagency and DoD efforts as it pertains to homeland security. Creating this common operating picture allows us an opportunity to prioritize our limited resources and meet mission requirements while maintaining MDA. Moreover, along with passenger, crew, and cargo information required by CBP, we can determine whether a suspicious person is on board a vessel, and by adding AIS, we can determine the position of the suspicious vessel. We believe NOA and AIS combined will serve as a deterrent and will enhance Coast Guard interdiction capabilities, but will not completely eliminate the risk of maritime transportation incidents. Utilizing NOA data in 2011, for example, Coast Guard Port State Control Officers targeted 8,909 vessels for security exams. During these exams, 237 deficiencies and 15 major control actions were issued for security related items, which enabled the Coast Guard to detect, identify, and deter suspicious vessels.

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<sup>37</sup> Maritime domain is defined as all areas and things of, on, under, relating to, adjacent to, or bordering on a sea, ocean, or other navigable waterway, including all maritime-related activities, infrastructure, people, cargo, and vessels and other conveyances. Note: The maritime domain for the United States includes the Great Lakes and all navigable inland waterways such as the Mississippi River and the Intra-Coastal Waterway.

Enhanced MDA has supported the missions of other agencies. For example, the U.S. Army Corps of Engineers and the Internal Revenue Service can now verify that vessels have reached their reported destination to transfer cargo or fuel. The National Oceanographic and Atmospheric Administration relies on AIS data to verify and monitor Right Whale reporting and vessel speed restrictions in certain areas, as well as to monitor unauthorized incursions or activities in National Marine Sanctuaries. The Environmental Protection Agency uses AIS data to monitor voluntary speed zones and to determine the potential sources of noxious or pollutant gases. The National Transportation Safety Board uses AIS archived data in maritime casualty investigations.

But the greatest beneficiary of enhanced MDA through the use of AIS is the mariner, because AIS provides pertinent navigation safety information that was not previously available to the mariner. The information greatly enhances a mariner's situational awareness and allows the mariner to take action in a timely manner to avoid the risk of a collision. Furthermore, AIS has become the 'honest broker' of information that has created an ancillary benefit of transportation efficiency. Vessels no longer compete to be the first in line for pilotage, lockage, berthing, or bridge openings. AIS provides more accurate positions and arrival times than was customary in typical voice reporting systems. MDA and navigational or situational awareness can be achieved in tandem or simultaneously from either a Class A or B device.

The acute recognition of the United States' waterside security vulnerabilities requires the Coast Guard to heighten its MDA. The essential elements of MDA include awareness, prevention, response, and consequence management. AIS strengthens maritime security through its effects on the first two elements, awareness and prevention.

AIS is a key element in attaining a sufficient level of MDA to enable the Coast Guard to quickly and accurately detect waterborne threats and to promptly notify appropriate first-responder assets, as well as vessels and facility operators, of terrorist threats. Working in conjunction with NOA, the expansion of AIS (and NOA) applicability in the final rule will include a significant number of smaller vessels that pose a threat to the United States, and would serve to create a synergistic effect with NOA. If for any reason information from one of these requirements is missed, not reported, or incorrectly communicated, it is our hope that the other requirement will capture the requisite information pertaining to identity, thereby creating the synergy between these requirements.

## **AIS Break-Even Analysis**

A break-even analysis is useful when it is not possible to quantify the benefits of a regulatory action. OMB Circular A-4 recommends a threshold or break-even analysis when non-quantified benefits are important to evaluating the benefits of a regulation. For the final rule, we calculate a potential range of break-even results using common passenger vessel thresholds for vessels that may be targets or may be used as attack vehicles. The scenarios depicted represent casualties and terrorist events that result in loss of life.

AIS helps reduce the risk of attack in two ways: (1) by reducing the likelihood of a successful attack, and (2) by reducing the consequences of a successful attack. Table 19 outlines the ways that AIS reduces the likelihood of a potentially successful attack.

**Table 19. Steps in Attack Process and Benefits of AIS Detection**

<b>Steps Required to Defeat Attack</b>	<b>How AIS Helps Detection</b>
Detect the attack	Find potentially threatening vessel(s). Works for VBIEDs.
Identify as an attack	Identify the vessels posing a threat. This can be direct (e.g., vessel complying with AIS requirements maintains collision/dangerous proximity course despite warnings/actions to avoid collision/proximity) or indirect (e.g., noncompliant vessel detected visually using radar or other means exhibits attacking behavior—often referred to as a filtering capability). Works for VBIEDs.
Decide how to defeat the attack	Determine if time for assistance/security forces available, if evasive action possible, etc. AIS helps by providing security forces specific, real-time data on vessel under attack, and potentially on attacking vessel and by potentially providing vessel under attack information on attacking vessel. Works for all attack types (information on attacking vessel reduces risk of VBIED attack only).
Engage the attack	Execute plan from previous step. AIS helps by providing real-time information that can be used to refine plan/engagement. Works for all attack types (information on attacking vessel reduces risk only of a VBIED attack).
Assess effectiveness of countermeasures	Determine whether engagement was effective. AIS helps by providing real-time effectiveness information. Works for all attack types (information on attacking vessel reduces risk only of a VBIED attack).

AIS also identifies vessels in position to assist with emergency response/search and rescue by showing the locations of vessels in response operations and their proximity to vessels in need of response resources. This works for all attack types by reducing the time to get assisting vessels on the scene of the incident.

We used \$9.1 million as an estimate of a VSL to represent an individual's willingness to pay to avoid a fatality involving maritime transportation and to calculate annualized benefits. Our VSL estimate is based on the 2013 memorandum from DOT titled "Guidance on Treatment of the Economic Value of a Statistical Life in U.S. Department of Transportation Analyses". A link to this memorandum is available on the docket as detailed under ADDRESSES in the preamble of the final rule. Table 20 below presents the dollar values associated with each loss of life resulting from a terrorist incident scenario.

In Table 20, we present the scenarios that show only the loss of human capital. We chose not to analyze scenarios with the loss of physical capital because there is no historical precedent within the maritime industry on which to base our analysis. We realize that an analysis based only on the loss of human capital, with no regard for physical assets, likely underestimates the monetary effects of a terrorist incident. Table 20 below shows the values of loss of life based on passenger vessel capacity amounts and using the VSL stated above. The capacity amount are 12 (as stated in Regulation 2 of SOLAS), 150

(threshold used in the 2003 AIS final rule), and 2,000 (for large cruise ships that may be potential targets of smaller vessels that may be affected by our final rule).

**Table 20. Dollar Values for Different Loss of Life Based on Passenger Vessel Capacity Amounts**

<b>Loss of Life from One Incident</b>	<b>Loss (\$Millions)</b>
12	109
150	1,365
2,000	18,200

Again, the scenarios above show the loss of human capital only for passenger vessels with certain passenger capacities specified above. With no regard for physical assets, our analysis likely underestimates the monetary effects of a terrorist incident. The human capital scenarios shown in the table above as potential benefits from casualties avoided provide a useful account of the risk reduction in years required for the final rule to break even. For example, using 150 as the number of lives lost in an incident, we multiply 150 by the VSL of \$9.1 million to obtain \$1.4 billion for the dollar value of the lives lost.

### **Methodology**

The break-even point is where the costs of the final rule are equal to the expected reduction in losses of an incident. A threshold or break-even analysis answers the question, “How small would the value of the non-quantified benefits need to be (or how large would the value of the non-quantified costs need to be) before the rule would yield zero net benefits?”<sup>38</sup>

One of the benefits of the final rule is the prevention of future casualty incidents. As such, the effectiveness of the final rule can be measured by the change (reduction) from the current state of risk/loss ( $L_b$ ) to the new resulting state of risk/loss after the final rule has become effective ( $L_n$ ). The point where the risk reduction is equal to the cost of the regulation ( $C_r$ ) is the break-even point, which can be defined as:

$$(1) \quad L_b - L_n = C_r$$

Where  $L_b$  is the current state of risk/loss,  $L_n$  is the new state of risk/loss resulting from this regulation, and  $C_r$  is the cost of the final rule.

Since the percent change in risk reduction is defined as  $(L_b - L_n)/L_b$ , equation (1) can be rewritten as follows to determine the percentage of risk reduction required for the regulation to be cost effective.

$$(2) \quad \% \text{ Risk Reduction} = \frac{(L_b - L_n)}{L_b} = \frac{C_r}{L_b}$$

<sup>38</sup> U.S. Office of Management and Budget, Circular A-4, September 17, 2003.

In the NPRM, we measured the reduction in risk using the expected number of lives saved in the scenarios presented. Because the types of events vary greatly, we calculated potential break-even results using a range of events that result in loss of life or casualties, as summarized in Table 21. We expect that most events would also involve asset destruction or other capital loss. Additional events involving loss of capital in addition to casualties would cause the change in risk reduction to be smaller (assuming constant costs) for costs to equal benefits. In the NPRM, we compared annualized costs to direct benefits to estimate the risk reduction required for the NPRM to break even.

We used annualized costs from the NPRM because we assumed that the final rule would result in a constant probability reduction in every year following its implementation. In other words, we assumed that the risk reduction resulting from the final rule would be constant each year. It is important to note that measuring benefits by focusing on specific scenarios avoided does not account for the possibility that the risk has been transferred and not reduced.

For the final rule, we measured the reduction in risk using the expected number of equivalent fatalities saved and using an estimate of \$9.1 million for the VSL as presented above. By using only the number of equivalent fatalities saved and not including any savings from avoided property damage, temporary shortages in trade goods, and/or environmental damage, we may be overstating the probability reductions required for benefits to equal the costs.

In addition, we used annualized costs because we assume that the final rule will result in a constant probability reduction in every year following its implementation. For this analysis, we use costs annualized at 7 percent over 10 years.

As noted earlier, we expect benefits of this final rule to include improved security, safety and environmental protection (pollution prevention, reduced injuries, etc.). The Coast Guard believes that this final rule will enhance maritime and navigation safety through a synergistic effect of NOA and AIS, and will strengthen maritime security and the overall national security of this. We expect that adding AIS to the final rule will increase situational awareness over and above just having NOA and would work synergistically with it. Therefore, it is important to know whether the marginal benefit of adding AIS is worth its marginal cost.

An alternative presentation using the above break-even analysis is to look at the return period, or the number of years the final rule would require for benefits to outweigh costs. If we use the 150-passenger threshold from the table above as our example, the benefit from casualties avoided is about \$1.4 billion using \$9.1 million as the VSL. Using the annualized cost of \$0.33 million for this population of passenger vessels affected by the final rule (288), we can determine the number of years the final rule will require to prevent one incident involving 150 casualties in order for benefits to outweigh costs. Multiplying \$0.33 million by the variable “time” and equating it to the benefit value of \$1.4 billion, we solve for time to obtain approximately 4,136 years, meaning the final rule would have to prevent one incident involving 150 casualties in this time period for the final rule to be beneficial. See Table 21 below.

Table 21 also presents the annual risk reduction required for passenger vessels with certain passenger capacities for the final rule to break even. We estimated the annualized cost for the 288 passenger vessels affected by the final rule to be \$0.33 million at a 7-percent discount rate. Using the scenario of

150 lives saved for passenger vessels affected by the final rule, approximately 0.02 percent of the annual risk reduction would be required for benefits to outweigh costs. These small changes in risk reduction suggest that the potential benefits of the final rule will justify the costs.

In the potential attack scenarios described below, AIS would be beneficial for other vessels in the presence of the potential attack-vessel by communicating via phone with nearby vessels or vessels in the vicinity of an attack.

**Table 21. Annual Risk Reduction Required for Cost to Equal Benefits for Passenger Vessels with Certain Passenger Capacities (Annual Costs at 7-percent Discount Rate)**

Potential Casualties Avoided	Benefit from Casualties Avoided (\$Millions)	Annualized Cost (\$Millions)	Risk Reduction Required (%)	Risk Reduction Required (years between averted attacks)	Potential Attack Scenarios
12	\$109.2	\$0.33	0.30%	331	Any attack against any size passenger vessel—reductions from combinations of reduced likelihood or consequence of a successful attack.
150	\$1,365	\$0.33	0.02%	4,136	Attack against ferry or cruise ship using large VBIED—reductions from combination of reduced likelihood or consequence of a successful attack.
2,000	\$18,200	\$0.33	0.0018%	55,152	Attack against cruise ship using large VBIED—reductions from combination of reduced likelihood or consequence of a successful attack.

### Summary of Costs and Benefits of AIS

The estimated costs of this rule’s AIS provisions exceed their estimated costs. Table 22 below summarizes the costs and benefits of AIS.

**Table 22. Summary of AIS Final Rule Costs and Benefits**

<b>Total Discounted AIS Costs</b>			
<b>Discount Rates</b>	<b>U.S.-flag Vessels</b>	<b>Foreign-flag Vessels</b>	<b>Total Cost</b>
7 percent discount rate	\$45.0	\$0.59	\$46.0
3 percent discount rate	\$53.4	\$0.70	\$54.1
<b><u>AIS Quantified Benefits</u></b>		<b><u>AIS Non-Quantified Benefits</u></b>	
<b>Injuries and Fatalities Avoided:</b>		<ul style="list-style-type: none"> <li>• Enhances MDA.</li> <li>• Improved Communications</li> <li>• Reduces near collision</li> </ul>	
7-percent discount rate (\$9.1M VSL)	\$25.1		
3-percent discount rate (\$9.1M VSL)	\$31.2		
<b>Pollution Avoided (bbls):*</b>			
7-percent discount rate	85		
3-percent discount rate	106		

However, the final rule responds to a statutory mandate to expand AIS. The final rule will implement requirements of MTSA and SOLAS. The final rule amends AIS and AIS-related regulations in 33 CFR parts 62, 66, 161, 164, and 165 necessary to implement section 102 of MTSA, Public Law 107–295, 116 Stat. 2064, which directs that AIS be installed and operating on most commercial vessels on the navigable waters of the United States. See 46 U.S.C. 70114. In addition, the final rule implements mandatory provisions of SOLAS. See specifically SOLAS, Chapter V, regulation 19.2.4, which requires all ships of 300 GT and upwards engaged on international voyages, cargo ships of 500 GT and upwards not engaged on international voyages, and passenger ships, irrespective of size, to be fitted with AIS, and regulation 2.4, which gives the United States discretion in implementing these AIS requirements for ships less than 150 GT. As a Contracting Government to SOLAS, the United States has a responsibility to implement mandatory SOLAS provisions such as these AIS, SOLAS Chapter V provisions. See SOLAS Art. I, SOLAS, 32 U.S.T. 47, and the Protocol of 1978 relating to SOLAS, 32 U.S.T. 5577. In addition, we believe that the AIS provisions will have unquantified security benefits as discussed above.

### **AIS Cumulative Impacts**

In response to public comments we received on the cumulative impact of AIS regulations as published in the NPRM, we present a cumulative impact of the MTSA 2003 AIS final rule and the AIS portion of our final rule (costs inflated to 2010 dollars). The authority to require AIS carriage was given to the Coast Guard under Section 102 of MTSA, Public Law 107–295, 116 Stat. 2064, which directs that AIS be installed and operating on most commercial vessels on the navigable waters of the United States. See 46 U.S.C. 70114. Additionally, SOLAS, Chapter V, regulation 19.2.4 requires all ships of 300 GT and upwards engaged on international voyages, cargo ships of 500 GT and upwards not engaged on international voyages, and passenger ships irrespective of size, to be fitted with AIS. As a Contracting Government to SOLAS, the United States has a responsibility to implement mandatory SOLAS provisions such as these AIS, SOLAS Chapter V provisions. See SOLAS Art. I, SOLAS, 32 U.S.T. 47, and the Protocol of 1978 relating to SOLAS, 32 U.S.T. 5577. In addition, it implements section 102 of

the Maritime Transportation Security Act of 2002 (MTSA), Public Law 107–295, 116 Stat. 2064, which directs that AIS be installed and operable on most commercial self-propelled vessels, towing vessels, and passenger vessels as determined by the Secretary; on the navigable waters of the United States (see 46 U.S.C. 70114). See Table 23 below, which shows the cumulative impacts of the 2003 MTSA AIS final rule and our final rule. We updated the costs and benefits to 2010 dollars. Monetized injuries and deaths for the 2003 MTSA AIS final rule were updated using the VSL of \$6.3 million.

**Table 23. Cumulative Impacts of AIS Final Rule**

Rule	Applicability (Affected Population)	Cost (Annualized, 7-Percent Discount Rate)	Benefit* (Annualized, 7-Percent Discount Rate)	Flexibility Offered
NOAD/AIS Final Rule (Docket USCG-2005-21869)	5,848 U.S. vessels for AIS	\$6.6 million Equipment and provision of NOA	<p><u>Quantified:</u>            Barrels of Oil Not Spilled = 12            Injuries and Fatalities Avoided Annually = \$25.1 million            Property Damage Avoided Annually = \$5.1 million (non-discounted)</p> <p><u>Non-quantified:</u>            Enhanced MDA, improved information-sharing, and improved overall communications leads to operational efficiency gains.</p>	Allowance of lower cost Class B units for certain vessel types based on requirements of final rule
MTSA AIS Final Rule (2003) (Docket USCG-2003-14757)	3,401 U.S. vessels	\$7.9 million Equipment and provision of NOA	<p><u>Quantified:</u>            Property Damage Avoided Annually = \$3.8 Million            Injuries and Fatalities Avoided Annually (Monetized) = \$2.5 Million            Pollution Avoided Annually (Monetized) = \$25,033</p> <p>Annual Total = \$6.3 Million</p> <p><u>Non-quantified:</u>            Improved</p>	<p>Fishing vessels, passenger vessels with less than 150 passengers, and all recreational vessels are exempt from equipment requirements but may carry the equipment at their discretion.</p> <p>Use of portable AIS units for non-SOLAS fleet is permissible as long as AIS does not interfere with other navigation/communication equipment.</p>

			information, improved communication, and reduced near collisions.	
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\*Quantified benefits presented are from an analysis of AIS casualty cases for the period 1993-2009.

The final rule adds additional vessel groups to those required to carry AIS under previous rules. These previously published rules and the vessel groups affected are outlined below.

The 2003 MTSA AIS final rule (Docket USCG-2003-14757) affects the following vessel groups:

- All vessels under SOLAS (i.e. vessels on an international voyage);
- All commercial, self-powered vessels of 65 feet or more in length in VTS areas;
- All passenger vessels that carry 150 passengers or more in VTS areas;
- All dredges and floating plants engaged in operations in VTS areas;
- Certain commercial towing vessels of 26 feet or more in length in VTS areas, and ;
- All foreign-flag vessels less than 300 GT (non-SOLAS) that make ports of call in the United States.

The Coast Guard’s NOAD/AIS final rule (Docket USCG-2005-21869) affects the following vessels:

- All self-propelled vessels (U.S.- and foreign-flag) of 65 feet or more in length engaged in commercial service, including fishing vessels;
- All towing vessels of 26 feet or more in length and more than 600 horsepower engaged in commercial service;
- All self-propelled vessels engaged in dredging operations in or near commercial channels or shipping fairways in a manner likely to restrict or affect navigation of other vessels;
- All passenger vessels less than 65 feet in length and certificated to carry more than 150 passengers, and;
- All self-propelled vessels engaged in the movement of flammable or combustible liquid cargo in bulk or CDCs as defined in subpart C of part 160.

AIS FR for Non-VTS Areas (Docket USCG-2005-21869)

- The AIS costs associated with our final rule as presented are a result of the AIS carriage requirement, which includes the AIS unit cost and the installation, maintenance, training, and replacement costs;
- The final rule requires the electronic submission of an NOA, and will modify related reporting content, timeframes, and procedures;
- For the period 1996-2010, we estimate the final rule will prevent 85 to 106 barrels of oil from being spilled during a 10-year period of analysis at 7- and 3-percent discount rates, respectively;
- Our evaluation of the 85 accident cases resulted in approximately \$5.1 million in property damage, or approximately \$350,000 per year, undiscounted. Year 2010 did not produce benefits, and;
- The final rule allows certain vessel owners and operators to install the less costly Class B AIS unit.

## 4. Final Regulatory Flexibility Act Analysis

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The Regulatory Flexibility Act of 1980 (RFA) (5 U.S.C. 601-612) requires agencies to consider the impact of their regulatory proposals on small entities, analyze effective alternatives that minimize small entity impacts, and make their analysis available for public comment. The RFA applies to a wide range of small entities, including small businesses, not-for-profit organizations, and small governmental jurisdictions.

The RFA explicitly states, “It is the purpose of this Act to establish as a principle of regulatory issuance that agencies shall endeavor, consistent with the objectives of the rule and of applicable statutes, to fit regulatory and informational requirements to the scale of the businesses, organizations, and governmental jurisdictions subject to regulation. To achieve this principle, agencies are required to solicit and consider flexible regulatory proposals and to explain the rationale for their actions to assure that such proposals are given serious consideration.”<sup>39</sup>

Therefore, as required in Section 604(a) and in accordance with the RFA, the Coast Guard prepared this Final Regulatory Flexibility Analysis (FRFA) that examines the impacts of the final rule on small entities (5 U.S.C. 601 *et seq.*). A small entity may be—

- A small independent business, defined as any independently owned and operated business not dominant in its field that qualifies as a small business under the Small Business Act (5 U.S.C. 632);
- A small not-for-profit organization; and
- A small governmental jurisdiction (locality with fewer than 50,000 people).

Section 604(a) of the RFA prescribes the content of the FRFA, which addresses the following:

- A description of the reasons why action by the agency is being considered;
- A succinct statement of the need for, and objectives of, the final rule;
- A description of and an estimate of the number of small entities to which the final rule will apply or an explanation of why no such estimate is available;
- A description of the projected reporting, recordkeeping, and other compliance requirements of the final rule, including an estimate of the classes of small entities which will be subject to the requirement and the type of professional skills necessary for preparation of the report or record;
- A summary of the significant issues raised by the public comments in response to the initial regulatory flexibility analysis, a summary of the assessment of the agency of such issues, and a statement of any changes made in the final rule as result of such comments;
- The response of the agency to any comments filed by the Chief Counsel for Advocacy of the Small Business Administration (SBA) in response to the NPRM, and a detailed statement of any change to the NPRM that is made in the final rule as a result of the comments;
- A description of the steps the agency has taken to minimize the significant economic impact of the final rule on small entities consistent with the stated objectives of applicable statutes, including a statement of the factual, policy, and legal reasons for selecting the alternative

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<sup>39</sup> <http://archive.sba.gov/advo/laws/regflex.html>

adopted in the final rule and why each one of the other significant alternatives considered by the agency which affect the impact on small entities was rejected.

Entities affected by the final rule are U.S.-flag vessel owners and operators that must submit NOAs and carry AIS on board for vessels that transit outside VTS areas. We compiled the data used in this analysis from publicly available and proprietary sources: Manta, ReferenceUSA, and the affected entities' websites. We used available owner's business information to identify the entities' primary line of business as coded by the North American Industry Classification System (NAICS) to find employee and revenue size information. We used this information to determine whether we should consider an entity "small" by comparing it to the SBA's "Table of Small Business Size Standards Matched to North American Industry Classification System Codes." In some cases, entities faced a standard based on the number of employees; in others, they faced a standard based on their annual revenue.<sup>40</sup>

We have discussed some of the issues above in other sections of the final rule and in this final RA. In this section, we will address the issues specific to small entities that we have not addressed elsewhere.

### **A Description of Why Action by the Agency Is Being Considered**

The purpose of the final rule is to expand the applicability of NOA and AIS in order to enhance MDA. Our intent in combining these two elements and expanding the vessels groups affected is to enhance MDA and national safety and security, and to meet the Congressional mandate for AIS units. The final rule will create a synergy between the requirements of NOA and those of AIS. The final rule will amend or change sections of 33 CFR parts 66, 160, 161, 164, and 165.

### **A Succinct Statement of the Need for and Objectives of the Final Rule**

The objectives of the final rule are to (1) implement a MTSA AIS mandate found at [46 U.S.C. 70114](#); (2) implement SOLAS AIS requirements, including provisions in V/19.2.4.3 that went into force internationally on July 1, 2008; and (3) expand NOA requirements and streamline the processing of these data to further enhance homeland security under PWSA authority (33 U.S.C. [1225](#) & [1226](#)) by increasing our awareness of vessels and people entering or departing U.S. ports or places.

The rule will affect a larger portion of relatively smaller vessels (including fishing vessels) that may pose a significant threat to U.S. security and that are not currently included under existing regulations.

The statutory authority for the Coast Guard to prescribe, change, revise, or amend the affected domestic regulation, 4 U.S.C. 83, 84, 85; 43 U.S.C. 1333; Pub. L. 107-296, 116 Stat. 2135; 33 CFR parts 160, 161, 164, and 165 is provided under 33 U.S.C. 1225(5), 1223, 1226, 1231, 2103, 3703; E.O. 12234, 45 FR 58801, 3 CFR, 1980 Comp., p. 277; Sec. 164.13 also issued under 46 U.S.C. 8502. Sec. 164.46 also issued under 46 U.S.C. 70114 and sec. 102 of Pub. L. 107-295. Sec. 164.61 also issued under 46 U.S.C. 6101; 14 U.S.C. 83, 84, 85; 43 U.S.C. 1333; Pub. L. 107-296, 116 Stat. 2135; 46 U.S.C. 8502 Chapter 701, 70114, 70117, Pub. L. 107-295, 116 Stat. 2064; subpart C is also issued under the authority of 33 U.S.C. 1225 and 46 U.S.C. 3715; 50 U.S.C. 191, 195; 33 CFR 1.05-1(g), 6.04-1, 6.04-6, and 160.5 as delegated to the Coast Guard in the Department of Homeland Security Delegation No. 0170.1.

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<sup>40</sup> Readers can access small entity information online at <http://www.sba.gov/size/indextableofsize.html>.

## A Description of and Estimate of the Number of Small Entities to which the Rule will Apply or an Explanation of Why No Such Estimate is Available

Based on Coast Guard’s MISLE database, which contains owner and operator information, we estimate that there are potentially 3,333 owners and operators of vessels that will be affected by either the NOA or AIS portion of the final rule. These owners and operators own or operate approximately 9,278 U.S. vessels affected by the final rule. We randomly selected a sample size of 345 vessel owners and operators to reach the 95-percent confidence level. We found revenue and employee information on 104 of the entities in the sample. Of these, we found 77 to be small entities according to SBA size standards. We did not find government or non-profit entities in our sample. We consider the 241 with no revenue or employee information to be small entities, as the lack of information potentially indicates smaller entity size.

We estimate the potential initial and annual revenue impact for each owner and operator who will be required by the final rule to have AIS on board and to complete the three additional NOA fields. We multiplied the initial and annual costs of AIS installation by the number of vessels that each entity owns, then divided that figure by the average annual revenues for each small entity, to obtain the share of costs to total annual revenues.

Table 23 presents the initial and annual revenue impacts for the sample of 77 small companies that we researched that had known average annual revenues. We estimate the cost per average small entity to install a Class B AIS unit to be about \$2,000, and the cost to install a Class A AIS unit to be \$4,772 excluding annual maintenance cost.<sup>41</sup> See Table 24 below.

**Table 24. Cost per Small Entity to Purchase Three AIS Units and Complete Three Additional NOA Fields**

Type of AIS Unit	Types of Vessels to Install	Average Cost per Owner or Operator to Purchase on Average Three AIS Units* and Complete Three Additional NOA Fields
<b>Class B plus NOA submission</b>	Commercial fishing vessels and those engaged in dredging operations.	\$6,051 (initial year: \$6,027 for three AIS units and \$24 for three additional NOA fields) \$774 (annually: \$250 for AIS maintenance and \$24 for three additional NOA fields)
<b>Class A plus NOA submission</b>	All other vessels classes listed in Table 6.	\$14,340 (initial year: \$14,316 for three AIS units and \$24 for three additional NOA fields) \$1,473 (annually: \$1,449 for AIS including updates and \$24 for three additional NOA fields)

\*Note: Each small entity owns, on average, three vessels.

<sup>41</sup> When estimating revenue impacts, we do not discount initial and annual costs or annual revenues.

The 77 small entities in our sample own a total of 244 vessels, or approximately 3 vessels each. Again, for the purpose of this analysis, because we were unable to determine design speed for certain classes of vessels (commercial fishing and dredges) that would be allowed to install the less costly Class B AIS unit, we assumed all owners would install a Class A AIS unit. Each small entity will purchase one AIS unit for each vessel it owns. A small entity that owns one vessel will purchase one AIS unit to meet the requirements of the final rule. Using Class A AIS as an example, if a small business owns one vessel, it will cost the owner \$3,230 to purchase the AIS unit, plus additional installation and training costs for three mariners as discussed in the cost section of this analysis. The initial estimated total cost for the Class A AIS unit will be \$3,230 plus \$969 for installation and \$330 for training, for a total of \$4,529, or approximately \$4,500, excluding any annual maintenance cost. In the initial year, Class A and Class B AIS units will need to be initialized, but only Class A AIS units update after the initialization; Class B AIS units do not update. We estimate it will cost \$10 per vessel (1,955 hours x \$31 per hour for the loaded labor rate, divided by 5,925 Class A vessels, which includes approximately 3,000 current Class A users in addition to 2,925 vessels that will install Class A units for this rule) for initialization for each Class A vessel affected by the final rule. We estimate it will cost \$233 to update Class A units annually (44,066 hours divided by 5,925 Class A vessels equals approximately 7.5 hours (rounded) per vessel x \$31 per hour). We now estimate the total cost in the initial year for a Class A AIS unit to be \$4,772 (\$4,529 + \$243) for initialization and updates. Since the average small entity owns three vessels, the total initial cost is estimated to be \$14,316 [(\$4,529 x 3 vessels) + (\$243 x 3 vessels)]. The estimated annual cost is \$1,449 [(\$250 for maintenance x 3 vessels) + (\$233 for updates x 3 vessels)] per entity.

For the NOA portion of the final rule, we estimate it will cost vessels owners \$8 per year to meet the requirements of the final rule. Referring to the cost section of the final rule, and using the mean number of trips (9) (made annually by U.S. vessels coming from a foreign port or place) for the conservative estimate and the number of U.S. vessels in our estimate of 3,430, the total number of hours for the 3,430 U.S. vessels affected by the NOA portion of this rule is approximately 926 hours for the additional three fields on the NOA form. We multiply this value by the loaded labor rate of \$31 per hour to obtain approximately \$28,706 for all U.S. vessels, or approximately \$8 per vessel annually (\$28,706/3,430 vessels), which comes to \$24 for three vessels. We estimate the total initial NOA/AIS cost for a small entity that owns three vessels to be \$14,340 [\$14,316 for AIS + (\$8 for NOA submission x 3 vessels)]. We estimate the total annual cost to be \$1,473 [\$1,449 for AIS + (\$8 for NOA submissions x 3 vessels)].

The estimated revenue impact on small entities is presented in Table 25.

**Table 25. Percentage of Estimated Revenue Impact on Small Entities That Own an Average of Three Vessels and Install Class A AIS Units and Submit Additional Three NOA Fields\***

Percent impact on annual revenue	Initial		Annual	
	Number of small entities with known revenue data	Percent of small entities with known revenue data	Number of small entities with known revenue data	Percent of small entities with known revenue data
0-1%	56	73%	75	97%
>1-3%	13	17%	2	3%
>3%	8	10%	0	0%
<b>Total</b>	<b>77</b>	<b>100%</b>	<b>77</b>	<b>100%</b>

Figures may not sum due to independent rounding.

\*For the purpose of the small entity analysis, we assumed affected U.S. vessel owners and operators would install Class A units.

As shown in the preceding table, the final rule will have a 1 percent or less impact on 73 percent of the small entities that own vessels that would have to comply with both the NOA and AIS portions of the final rule during the first year that it is in effect. Annually, the final rule will have a 1 percent or less impact on 97 percent of the small entities that we sampled.

## Types of Entities Affected by the Final Rule

The final rule will affect owners and operators of vessels that must submit NOAs and carry an AIS unit on board. The 77 small entities for which we found industry, revenue, and employee information are represented by 34 different NAICS codes. We found that 7 NAICS codes represent 42 of the 77 small entities in our sample, or approximately 55 percent. The other 27 NAICS codes represent the remaining 45 percent, or 35 small entities, in our sample. Table 26 presents the most represented NAICS codes for the types of small entities affected by the final rule.

**Table 26. NAICS Codes, Descriptions, Definitions, Numbers, and Percentages of Small Businesses Affected by the Final Rule**

NAICS Code	Description	Small Business Definition	Number of Small Entities	Percentage of Small Entities
114111	Finfish fishing	< \$4.0M annual rev.	8	10.4%
114112	Shellfish fishing	< \$4.0M annual rev.	7	9.10%
483211	Inland water freight transportation	< 500 employees	6	7.8%
488330	Navigational Services to Shipping	< \$7.0M annual rev.	6	7.8%
424460	Fish and seafood merchant wholesalers	< 100 employees	6	7.8%
336611	Ship building and repairing	< 1,000 employees	5	6.50%
238910	Site preparation contractors	< \$14.0M annual rev.	4	5.2%
Other	Various*		35	45.5%
<b>Total**</b>			<b>77</b>	<b>100.0%</b>

\* Two or fewer companies in a NAICS category.

\*\* Figures may not sum due to independent rounding.

## A Description of the Projected Reporting, Recordkeeping, and Other Compliance Requirements of the Final Rule, Including an Estimate of the Classes of Small Entities that Will be Subject to the Requirement and the Type of Professional Skills Necessary for Preparation of the Report or Record

The final rule will require modifications to two existing OMB-approved collections: “Advance Notice of Arrival and Departure” (OMB Control Number 1625-0100) and “Enhanced Maritime Domain Awareness via Electronic Transmission of Vessel Transit Data” (OMB Control Number 1625-0112). One data element will be added to the collection of information (1625-0100), the Vessel Response Plan control number from the Nontank Vessel Response Plan final rule. We believe the burden for this additional element is so minimal that a change to the total burden estimate for this collection is unnecessary (see the Paperwork Reduction Act section of this RA).

Vessel owners and operators will continue to be required to submit NOAs as required in 33 CFR part 160 and as required by the CBP. The collection of information accounts for all vessels that are required to submit NOAs. The change in the burden hours for 1625-0100 is an adjustment to the collection of information; the change in the burden hours for 1625-0112 is a program change to the collection of information.

The projected reporting and recordkeeping, other compliance requirements of the final rule, and the types of professional skills necessary for the submission of NOAs and the carriage of AIS are described in the Cost and Paperwork Reduction Act sections of this RA.

### **A Summary of the Significant Issues Raised by Public Comments in Response to the Initial Regulatory Flexibility Analysis, a Summary of the Assessment of the Agency of Such Issues, and a Statement of Any Changes Made in the Final Rule as a Result of Such Comments**

We received several public comments on the NPRM regarding the financial impact of both the NOA and the AIS requirements on small entities. We address small entity impacts for each portion of the final rule separately below.

**NOAD:** We received public comments on the Initial Regulatory Flexibility Analysis stating that the final rule will have a disproportionate adverse economic effect on owners of vessels of 300 GT or less. In an attempt to alleviate some of the burden of the NOAD requirements on small entities, we have removed the NOD requirement in the final rule. In addition, a COTP has the discretion to grant waivers for vessels 300 GT or less transiting 2 or more COTP zones under 33 CFR 160.214. United States- flag vessels of this size are currently exempt. Ferries operating exclusively within the same COTP zone and not carrying a CDC will continue to be exempt from the requirements of the subpart. Ferries that operate on a fixed route between two or more COTPs zones and on a regular schedule will automatically be exempt from NOA requirements if they submit less information (one-time) using an alternative under 160.204(a)(5)(vii), which has been a common industry practice since 2003 and imposes no new costs on this population of vessels.

**AIS:** We received public comments stating that AIS implementation is too costly and should not be required for smaller vessel owners. Aside from the Congressional mandate for the AIS carriage requirement, we decided to amend the AIS requirement to allow commercial fishing vessels, self-propelled vessels engaged in dredging operations in or near a commercial channel or shipping fairway in a manner likely to restrict or affect navigation of other vessels, and passenger vessels that carry 50 or more passengers to install the less costly Class B AIS unit. The Class B AIS unit is significantly less expensive than the Class A AIS unit—approximately one quarter of the cost (see the cost analysis for our estimates of each unit in this RA). This change in the requirement will impact approximately 55 percent of the affected population of vessels and should alleviate some of the economic burden on smaller vessel owners. Owners of vessels that install a Class B AIS unit will realize a savings of approximately \$2,500 per unit as opposed to a Class A AIS unit. In addition, the Coast Guard will not require passenger vessels affected by the final rule to carry an AIS unit if they do not operate beyond 1 mile from shore.

## **The Response of the Agency to Any Comments Filed by the Chief Counsel for Advocacy of the Small Business Administration in Response to the Proposed Rule, and a Detailed Statement of Any Change Made to the Proposed Rule in the Final Rule as a Result of the Comments**

We did not receive comments on the NPRM from the Chief Counsel for Advocacy of the Small Business Administration.

### **A Description of the Steps the Agency has Taken to Minimize the Significant Economic Impact on Small Entities Consistent with the Stated Objectives of Applicable Statutes, including a Statement of the Factual, Policy, and Legal Reasons for Selecting the Alternative Adopted in the Final Rule and Why Each One of the Other Significant Alternatives to the Rule Considered by the Agency that Affect the Impact on Small Entities was Rejected**

The NOA requirements in the final rule for all vessels, regardless of size, coming from a foreign port or place are the same as those in the CBP APIS final rule. Our final rule adds three new NOA fields and requires foreign-flag vessels 300 GT or less to submit NOAs if transiting 2 or more COTP zones. The additional three NOA fields add a very small burden to small vessel owners and operators; we estimate it will take an additional 2 minutes of time to complete the new fields. In addition, each COTP will have the discretion to grant waivers for vessels under 33 CFR 160.214. Ferry owners and operators will continue to be exempt from NOA requirements if operating exclusively within one COTP zone and not carrying a CDC. Ferries that operate on a fixed route between two or more COTPs zones and on a regular schedule will automatically be exempt from NOA requirements if they submit less information (one-time) using an alternative under 160.204(a)(5)(vii), a lesser burden.

In drafting the final rule, we considered lowering the threshold for reporting an NOA to 100 GT. However, we determined that this lower threshold would have left vessels below 100 GT less safe. Therefore, we instead decided to lower the weight threshold to zero GT to align with the requirements in the CBP APIS final rule. This adjustment will ensure that we capture all foreign vessels and U.S. commercial vessels transiting to and from U.S. ports and allow us to maintain and strengthen our MDA.

The AIS portion of the final rule is based on a Congressional mandate for the carriage of AIS units on board commercial vessels of a certain size. Based on public comments we received that the final rule is too costly for smaller vessel owners and operators, we made the decision to allow certain vessel owners and operators to install the less costly Class B AIS unit (see the cost analysis section of this RA for an estimate of AIS unit costs), which should alleviate some of the cost burden on smaller vessel owners and operators.

### **Other Federal Rules**

The requirements in our final rule overlap with the provisions contained in the CBP APIS final rule and our submission times for NOAs match those of the CBP for all commercial vessels arriving from a foreign port or place. However, the overlap does not extend to domestic traffic (United States-to-United States arrivals) or recreational vessels. We believe that our final rule will not create additional burdens on industry because both agencies worked in unison in order not to collect duplicate information.

## 5. Paperwork Reduction Act

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The final rule calls for two collections of information under the Paperwork Reduction Act of 1995 (44 U.S.C. 3501-3520), one is a revision to an existing collection and the other is a new collection. The following is an analysis for the burden associated with the revision and the new collection.

As defined in 5 CFR 1320.3(c), “collection of information” comprises reporting, recordkeeping, monitoring, posting, labeling, and other similar actions. The title and description of the information collection, a description of those who must collect the information, and an estimate of the total annual burden follow. The estimates cover the time needed to submit an NOA and to enter information into an AIS unit.

Sections 160.201, 160.202, 160.203, 160.206, 160.207, 160.208, 160.210, 160.212, and 160.213 of the final rule amend the collection of information requirements for vessel owners and operators. The Coast Guard needs this information to determine whether an entity meets statutory requirements. These provisions will require modifying the burden in the previously approved collections under OMB Control Numbers 1625-0100 and 1625-0112.

*Title:* Advance Notice of Arrival and Electronic Transmission of Vessel Transit Data.

*OMB Control Number:* 1625-0100 and 1625-0112.

*Summary of the Collections of Information:* The final rule will require vessel owners and operators to submit NOAs electronically to the NVMC under §§ 160.206 and 160.207. This requirement will require a change in the previously approved OMB Collection 1625-0100, because it expands the NOA requirement to include vessels greater than 300 GT for U.S. commercial vessels, foreign vessels down to 0 GT, and U.S. commercial vessels 300 GT or less coming from a foreign port or place. However, our final rule mimics the requirements of the CBP APIS final rule for vessels coming from or departing to a foreign port or place. Our final rule will require any foreign-flag vessel 300 GT or less that transits 2 or more COTP zones to submit an NOA, which is an additional NOA burden. Based on Coast Guard data, we estimate this population of vessels to be 500. Our final rule also adds three new data fields to the NOA information requirements, which we estimate will take 2 minutes to complete. All vessels must comply with this requirement. The NOA change in the 1625-0100 collection of information will be an adjustment. We also expect approximately 150 waivers annually, at a cost of approximately \$10,000.

The final rule will require vessel owners and operators to submit electronically information that is entered into an AIS unit. This requirement represents a new collection of information for owners and operators of vessels 65 or more in length outside of VTS areas, passenger vessels certificated to carry 150 or more passengers outside VTS areas, commercial towing vessels 26 feet or more in length and 600 horsepower outside VTS areas, dredges, derrick cranes, floating plants, and high-speed craft. We plan to collect, store, and analyze data transmitted by AIS to enhance MDA. Awareness and threat knowledge are critical for securing the maritime domain and are the key to preventing adverse events. Domain awareness enables the early identification of potential threats and enhances appropriate responses, including interdiction at an optimal distance, with capable prevention forces. The AIS collection of information will be a program change.

*Need for Information:* The Coast Guard needs this information to determine whether an entity meets the statutory requirements.

*Proposed Use of Information:* The Coast Guard will use this information to determine whether an entity meets the statutory requirements.

*Description of Respondents:* The respondents are vessel owners and operators who make port calls in the United States. Each vessel making a port call in the United States is required to submit an NOA before entering a U.S. port. For AIS, the respondents are vessels that carry AIS on board.

*Number of Respondents:* The existing OMB-approved number of respondents, as adjusted on December 9, 2010, is 31,594. The final rule would decrease the number of respondents in this OMB-approved collection to a total of approximately 18,377 (3,430 U.S.-flag vessels and 14,947 foreign-flag vessels). For AIS, the number of respondents is new and increases by approximately 8,922 (5,848 U.S.-flag vessels and 74 foreign-flag vessels and approximately 3,000 existing AIS users). The new total will be approximately 9,535, including 613 respondents from LRIT.

*Frequency of Response:* The existing OMB-approved number of responses, as adjusted on December 9, 2010, is 171,016. The final rule would decrease the number of responses in this OMB-approved collection to a total of approximately 107,605 (30,870 responses from U.S.-flag vessel owners and operators and 76,735 responses from foreign-flag vessel owners and operators using the mean number of trips, not including 150 waivers). For AIS, the number of responses is new and increases by approximately 533,944 annually to a total of approximately 534,557 (533,574 from U.S.-flag vessel owners and operators and 370 from foreign-flag vessel owners and operators including 613 responses from LRIT).

*Burden of Response:* The burden of the final rule arises from an increase in the number of NOAs and from the number of foreign-flag vessels 300 GT or less that transit 2 or more COTP zones. We assume that it will take 30 minutes per vessel to submit an NOA to the NVMC, plus an additional 2 minutes for all vessels for the three additional NOA fields. For AIS, the burden arises from initializing the unit and entering the necessary information electronically. We assume it will take approximately 20 minutes to initialize the unit and approximately 5 minutes per voyage to enter the information.

*Estimate of Total Annual Burden:* The existing OMB-approved total annual burden, as adjusted on December 9, 2010, is 163,994 hours. The initial year and annual total burden for NOA will increase to approximately 168,162 hours (which includes an additional 4,168 hours from the final rule and assuming a constant number of submittals), not including 150 waivers. For AIS, the new burden will increase by approximately 47,041 hours to a total of approximately 47,245 hours annually (assuming a constant number of submittals), including 204 hours from LRIT.

## Appendix A

Detail of Casualties that Would Have Been Affected by AIS (1996-2003), U.S. Vessels

Year	Case/ Activity	Casualty	Location	U.S. Fatalities	U.S. Injuries	Total Value of Life/Injury (VSL=\$9.1 Million)	Pollution (bbls spilled)	Percent of Case Used
1996	MC9600145 9	ALLISION	NULL	0	0	0	0	100
1996	MC9600173 2	COLLISION	NAVIGABLE WATERS NEC	0	0	0	0	100
1996	MC9600260 5	COLLISION	GULF OF MEXICO COASTAL	0	1	955,500	0	100
1996	MC9600441 0	COLLISION	INTERCOASTAL WTRWY- GULF	0	0	0	0	100
1996	MC9600544 4	COLLISION	MONONGAHELA RIVER	0	0	0	0	100
1996	MC9600686 8	COLLISION	GULF OF MEXICO 12-200 MILES	0	0	0	0	100
1996	MC9600713 8	ALLISION	OHIO RIVER	0	1	27,300	0	100
1996	MC9600918 8	COLLISION	LOWER MISSISSIPPI RIVER	0	0	0	0	100
1996	MC9601480 7	GROUNDING	LOWER MISSISSIPPI RIVER	0	0	0	0	100
1996	MC9601500 8	COLLISION	INTERCOASTAL WTRWY- GULF	0	0	0	0	100
1996	MC9601705 4	COLLISION	LOWER MISSISSIPPI RIVER	0	0	0	0	100
1996	MC9601713 6	COLLISION	GULF OF MEXICO COASTAL	0	0	0	0	100
1996	MC9601734 4	COLLISION	GULF OF MEXICO 12-200 MILES	0	0	0	0	100
1996	MC9601818 2	COLLISION	NAVIGABLE WATERS NEC	0	1	27,300	0	100
1996	MC9700022 3	COLLISION	INTERCOASTAL WTRWY- GULF	0	0	0	0	100
1997	MC9700057 7	COLLISION	GULF OF MEXICO	0	0	0	0	100

1997	MC9700380 7	COLLISION	ATCHAFALAYA RIVER	0	0	0	0	100
1997	MC9701238 4	COLLISION	CORPUS CHRISTI SHP CHNL	0	0	0	0	100
1997	MC9701383 1	COLLISION	INTERCOASTAL WTRWY- GULF	0	0	0	0	100
1997	MC9701489 1	COLLISION	VERMILLION BAY	0	0	0	0	100
1997	MC9701797 1	COLLISION	GULF OF MEXICO COASTAL	0	0	0	0	100
1997	MC9800056 8	COLLISION	LOWER MISSISSIPPI RIVER	0	0	0	0	100
1998	MC9800007 8	COLLISION	INTERCOASTAL WTRWY- GULF	0	0	0	0	100
1998	MC9800041 6	COLLISION	GULF OF MEXICO 12-200 MILES	0	0	0	0	100
1998	MC9800393 8	COLLISION	GULF OF MEXICO COASTAL	0	0	0	0	100
1998	MC9800514 2	COLLISION	LOWER MISSISSIPPI RIVER	0	0	0	0	100
1998	MC9801031 9	COLLISION	INTERCOASTAL WTRWY- GULF	0	0	0	0	100
1998	MC9801196 9	ALLISION	INTERCOASTAL WTRWY- GULF	0	0	0	0	100
1998	MC9801365 6	GROUNDING	PORT ALLEN ROUTE	0	0	0	0	100
1998	MC9801523 9	COLLISION	INTERCOASTAL WTRWY- GULF	0	0	0	0	100
1998	MC9801566 9	COLLISION	GULF OF MEXICO 12-200 MILES	0	0	0	167	100
1998	MC9801600 6	COLLISION	DELAWARE RIVER	0	0	0	0	100
1999	MC9900088 3	COLLISION	LOWER MISSISSIPPI RIVER	1	7	10,091,900	0	100
1999	MC9900088 4	COLLISION	LOWER MISSISSIPPI RIVER	0	0	0	0	100
1999	MC9900110 0	COLLISION	GULF OF MEXICO 12-200 MILES	0	0	0	0	100
1999	MC9900331	ALLISION	OHIO RIVER	0	0	0	0	100

	3							
1999	MC9900556 7	COLLISION	INTERCOASTAL WTRWY- GULF	0	0	0	0	100
1999	MC9900668 0	COLLISION	TOMBIGBEE RIVER	0	0	0	0	100
1999	MC9901100 1	COLLISION	INTERCOASTAL WTRWY- GULF	0	0	0	0	100
1999	MC9901104 0	COLLISION	NULL	0	0	0	0	100
1999	MC9901304 1	COLLISION	CHICAGO SHIP CANAL	0	0	0	0	100
1999	MC9901400 5	COLLISION	DELAWARE BAY	0	0	0	0	100
1999	MC9901442 6	COLLISION	INTERCOASTAL WTRWY- GULF	0	0	0	0	100
1999	MC9901586 5	COLLISION	GULF OF MEXICO COASTAL	0	0	0	0	100
2000	MC0000142 2	COLLISION	BERING SEA	0	0	0	0	100
2000	MC0001046 5	GROUNDING	OHIO RIVER	0	0	0	0	100
2000	MC0001188 2	COLLISION	ILLINOIS RIVER	0	0	0	0	100
2000	MC0001376 3	COLLISION	NAVIGABLE WATERS NEC	0	0	0	0	100
2000	MC0001456 4	COLLISION	LOWER MISSISSIPPI RIVER	0	0	0	0	100
2001	MC0101172 6	ALLISION	HUDSON RIVER (N OF 41 00 N)	0	0	0	0	100
2001	MC0100515 1	COLLISION	OHIO RIVER	0	0	0	0	100
2001	MC0101090 1	COLLISION	GULF OF MEXICO 12-200 MILES	0	0	0	0	100
2002	1485154	COLLISION	GULF OF MEXICO	0	0	0	0	100
2002	1491964	COLLISION	LOWER MISSISSIPPI RIVER	0	0	0	0	100
2002	1493713	COLLISION	ELK RIVER	4	1	36,827,700	12	100
2002	1494888	ALLISION	LOWER MISSISSIPPI RIVER	0	0	0	0	100

2002	1599828	COLLISION	INTERCOASTAL WTRWY-GULF	0	0	0	0	100
2002	1638788	COLLISION	INTERCOASTAL WTRWY-GULF	0	0	0	0	100
2002	1687544	COLLISION	LOWER MISSISSIPPI RIVER	0	1	27,300	0	100
2002	1711644	COLLISION	GULF OF MEXICO	0	1	27,300	0	100
2003	1744365	ALLISION	INTERCOASTAL WTRWY-GULF	0	0	0	0	100
2003	1809458	ALLISION	LOWER MISSISSIPPI RIVER	0	0	0	0	100
2003	1897784	COLLISION	GULF OF MEXICO	0	1	27,300	0	100
2003	1936744	COLLISION	PACIFIC OCEAN	0	0	0	0	100
<b>TOTAL</b>				<b>5</b>	<b>14</b>	<b>\$48,011,600</b>	<b>179</b>	

Notes:

1. Personnel casualties exclude losses suffered on non-U.S. vessels.
2. VSL is the value of statistical life for prevention of injury and death; "Valuing Mortality Risk Reductions in Homeland Security Regulatory Analyses," Industrial Economics, Inc., April 2008.
3. One barrel (bbl) = 42 U.S. gallons.

## Appendix B

### Summary of AIS-Preventable Annual Personnel Casualties and Pollution by Year

Year	Cost of Injury/Death (VSL = \$9.1M)	Pollution (bbls)
1996	1,010,100	0
1997	0	0
1998	0	167
1999	10,091,900	0
2000	0	0
2001	0	0
2002	36,882,300	12
2003	27,300	0
Subtotal:	\$48,011,600	179
Average (Total/8Years):	\$6,001,450	22 per year
Year	Cost of Injury/Death VSL = \$6.3M	Pollution (bbls)
2004	54,600	0
2005	9,555,000	11
2006	81,900	2
2007	0	0
2008	0	0
2009	0	19
2010	0	0
Subtotal:	\$9,691,500	32
Total	\$57,703,100	5 per year
Average (Total/14 Years):	\$4,121,650	14 barrels per year

## Appendix C

### Detail of Casualties That Would Have Been Affected By AIS (2004-2009)

Activity ID	Vessels Involved	Injuries	Fatalities	Damage	Pollution (Gallons)	Location	Year	Incident Type	Percent of Case Used
1977029	Fishing and Passenger	2		\$ 82,000.00		Gulf of Mexico	2004	collision	100
2099204	Fishing and Towing			\$ 5,000.00		Gulf Intracoastal Waterway	2004	collision	100
2221829	Fishing			\$ 65,000.00		Chatham Strait, AK	2004	collision	100
2252747	Fishing and Towing			\$ 2,000.00		Tampa Bay ship channel	2004	collision	100
2267718	Fishing and Cargo			\$ 35,000.00		Gulf of Mexico	2004	collision	100
2345685	Passenger and Tank Ship	2	1	\$ 550,000.00	450	Neches River	2005	collision	100
2368175	Towing and Dredge			\$ 6,000.00		Gulf Intracoastal Waterway MM323	2006	collision	100
2563785	Fishing and Towing			\$ 850,000.00	100	San Pedro Channel	2006	collision	100
2695549	Fishing	3		\$ 10,000.00		Gulf of Mexico	2006	collision	100
2716248	Fishing and Towing			\$ 80,000.00		Sabine River, TX	2006	collision	100
2895542	OSV and Towing			\$ 30,000.00		Lower Atchafalaya River	2007	collision	100
2990497	Passenger			\$ 70,000.00		Reserve Channel, MA	2007	collision	100
3150529	Towing			\$ 77,500.00		Illinois River MM114.4	2008	collision	100
3673728	OSV and Passenger			\$ 10,000.00		Atchafalaya River	2008	collision	100
3379732	Towing			\$ 200,000.00		Upper Mississippi River MM 81	2008	collision	100

3417489	Fishing and Towing			\$ 20,000.00	800	Tampa Bay ship channel	200 9	collisio n	100
3458096	Towing			\$ 10,000.00		Arkansas/ Verdigris River MM 429	200 9	collisio n	100
3470288	Fishing			\$ 2,500.00		Atlantic Ocean	200 9	collisio n	100
Totals		7	1	\$ 2,099,000.00	1,350				

## **Appendix D**

### **Post Casualty Drug and Alcohol Testing From Example Casualty Case 1. (Names of Crew and Testing Services Have Been Removed)**

Pursuant to Title 46 Code of Federal Regulations, Part 4.06 – Mandatory Chemical Testing Following Serious Marine Incidents Involving Vessels In Commercial Service; post-casualty drug and alcohol testing was conducted on all individuals involved in this incident. The results are as follows:

#### **Pilot**

The results of the Pilot's tests were confirmed NEGATIVE.

#### **Crew of A.V. KASTNER:**

Following the collision, the entire ship's crew was subjected to post-casualty drug and alcohol testing. Alcohol tests were conducted within 2 hours of the collision, with negative results. Later in the day the entire crew underwent post-casualty chemical testing. All results were confirmed NEGATIVE.

#### **Crew of BUCHANAN-14:**

All four members of the crew of the BUCHANAN-14 submitted to post-casualty drug and alcohol testing in accordance with USCG/DOT regulations at approximately 10:35 p.m. on 25 February 2002. All tests were confirmed NEGATIVE.

#### **Crew of SWIFT / Norfolk Dredging Crew:**

Crew members submitted to chemical testing in accordance with USCG/DOT regulations on the morning of 26 February 2002. Tests confirmed NEGATIVE.

Two other crew members submitted to chemical testing in accordance with USCG/DOT regulations on the morning of 26 February 2002. The sample collection was confirmed NEGATIVE. The sample provided by one crew member was confirmed POSITIVE FOR MARIJUANA METABOLITE by the same MRO.

Another crew member submitted to chemical testing in accordance with USCG/DOT regulations on the morning of 26 February 2002. The sample collection was confirmed NEGATIVE.

Following the accident, one crew member was flown to University Hospital, Shock Trauma for possible injuries sustained during the accident. Blood and urine samples were drawn and results for tests conducted for the presence of the five substances listed as part of USCG/DOT drug testing requirements were NEGATIVE.

Results of toxicology tests performed during the autopsies of four crew members were all NEGATIVE, indicating no evidence of drug and or alcohol use by either individual.

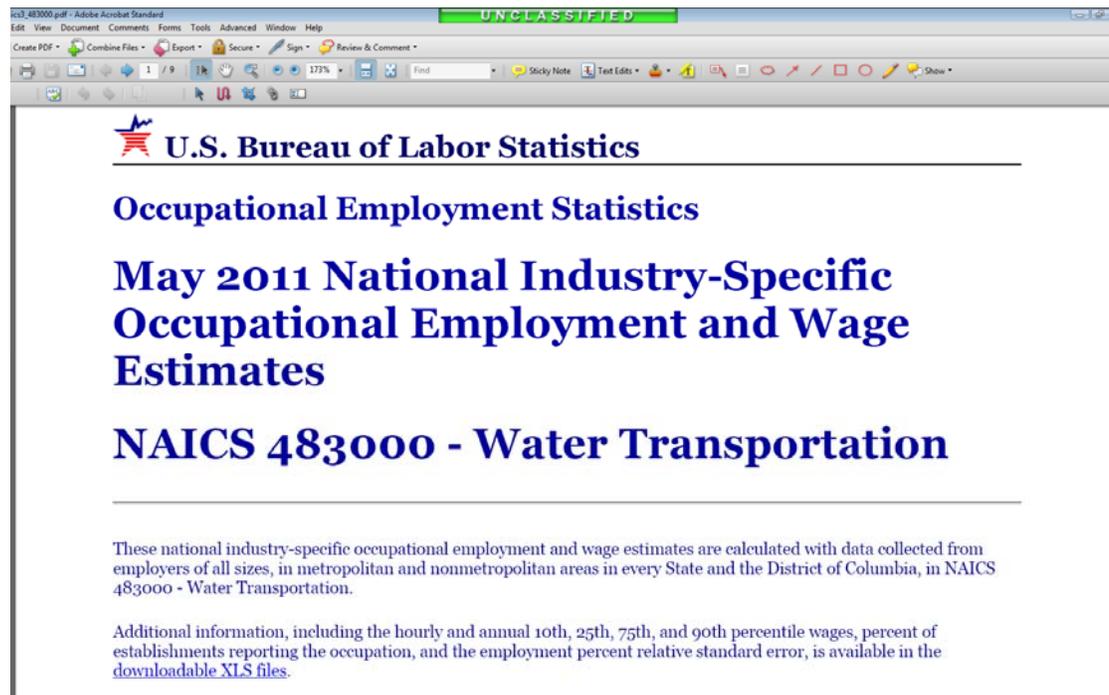
**Findings and Conclusion:**

The proximate cause of this casualty was the apparent loss of situational awareness on the part of the Captain/Master of the BUCHANAN-14, while operating in restricted visibility following an unexpected encounter with heavy fog and his failure to adequately assess the risk of collision under the prevailing circumstances. Evidence suggests the Captain failed to adequately monitor the A.V. KASTNER's movement as well as his own vessel's movement and position relative to oncoming traffic which resulted in his vessel and associated tow being placed in the path of, and colliding with the M/V A.V. KASTNER.



# Appendix E

## May 2011 National Industry-Specific Occupational Employment and Wage Estimates



UNCLASSIFIED

U.S. Bureau of Labor Statistics

Occupational Employment Statistics

**May 2011 National Industry-Specific Occupational Employment and Wage Estimates**

**NAICS 483000 - Water Transportation**

These national industry-specific occupational employment and wage estimates are calculated with data collected from employers of all sizes, in metropolitan and nonmetropolitan areas in every State and the District of Columbia, in NAICS 483000 - Water Transportation.

Additional information, including the hourly and annual 10th, 25th, 75th, and 90th percentile wages, percent of establishments reporting the occupation, and the employment percent relative standard error, is available in the [downloadable XLS files](#).

NAICS Industry 483000 - Water Transportation is part of: [Sectors 48 and 49 - Transportation and Warehousing](#).

NAICS 483000 - Water Transportation consists of:

- [NAICS 483100 - Deep Sea, Coastal, and Great Lakes Water Transportation](#)
- [NAICS 483200 - Inland Water Transportation](#)

[Links to OES estimates for other industries](#)

SOC Major Groups in NAICS 483000 - Water Transportation:

- [00-0000 All Occupations](#)
- [11-0000 Management Occupations](#)
- [13-0000 Business and Financial Operations Occupations](#)
- [15-0000 Computer and Mathematical Occupations](#)
- [17-0000 Architecture and Engineering Occupations](#)
- [19-0000 Life, Physical, and Social Science Occupations](#)
- [23-0000 Legal Occupations](#)
- [27-0000 Arts, Design, Entertainment, Sports, and Media Occupations](#)
- [29-0000 Healthcare Practitioners and Technical Occupations](#)
- [33-0000 Protective Service Occupations](#)
- [35-0000 Food Preparation and Serving Related Occupations](#)
- [37-0000 Building and Grounds Cleaning and Maintenance Occupations](#)
- [39-0000 Personal Care and Service Occupations](#)
- [41-0000 Sales and Related Occupations](#)
- [43-0000 Office and Administrative Support Occupations](#)
- [47-0000 Construction and Extraction Occupations](#)
- [49-0000 Installation, Maintenance, and Repair Occupations](#)
- [51-0000 Production Occupations](#)

To sort this table by a different column, click on the column header

### NAICS 483000 - Water Transportation

Occupation code	Occupation title (click on the occupation title to view an occupational profile)	Group	Employment	Employment RSE	Percent of total employment	Median hourly wage	Mean hourly wage	Annual mean wage	Mean wage RSE
00-0000	All Occupations	major	60,970	5.4%	100.00%	\$21.68	\$27.10	\$56,380	1.4%
11-0000	<a href="#">Management Occupations</a>	major	3,540	8.1%	5.81%	\$52.54	\$60.72	\$126,310	3.1%
11-1011	<a href="#">Chief Executives</a>		270	16.9%	0.45%	(5)	\$103.60	\$215,500	7.3%
11-1021	<a href="#">General and Operations Managers</a>		1,350	9.3%	2.22%	\$51.54	\$61.52	\$127,970	4.9%
11-2021	<a href="#">Marketing Managers</a>		80	11.9%	0.12%	\$49.09	\$57.76	\$120,140	7.8%
11-2022	<a href="#">Sales Managers</a>		170	12.8%	0.27%	\$49.72	\$53.50	\$111,280	5.8%
11-3011	<a href="#">Administrative Services Managers</a>		260	16.9%	0.43%	\$46.51	\$50.12	\$104,260	5.3%
11-3021	<a href="#">Computer and Information Systems Managers</a>		130	10.1%	0.21%	\$60.00	\$59.75	\$124,290	3.4%
11-3031	<a href="#">Financial Managers</a>		260	13.4%	0.42%	\$58.58	\$65.07	\$135,340	4.7%
11-3061	<a href="#">Purchasing Managers</a>		110	14.1%	0.18%	\$43.22	\$49.66	\$103,290	9.7%
11-3071	<a href="#">Transportation, Storage, and Distribution Managers</a>		440	7.8%	0.72%	\$45.85	\$49.11	\$102,160	4.1%
11-3121	<a href="#">Human Resources Managers</a>		70	14.5%	0.11%	\$49.14	\$56.12	\$116,730	8.6%

11-9041	<a href="#">Architectural and Engineering Managers</a>	110	25.5%	0.18%	\$59.20	\$63.18	\$131,410	7.0%
11-9199	<a href="#">Managers, All Other</a>	230	14.1%	0.37%	\$47.78	\$48.16	\$100,170	4.0%
13-0000	<a href="#">Business and Financial Operations Occupations</a>	major 3,090	7.1%	5.06%	\$30.28	\$32.46	\$67,510	2.1%
13-1022	<a href="#">Wholesale and Retail Buyers, Except Farm Products</a>	100	29.9%	0.16%	\$23.46	\$26.88	\$55,920	7.7%
	<a href="#">Purchasing Agents, Except</a>							

[http://data.bls.gov/cgi-bin/print.pl/oes/current/naics3\\_483000.htm](http://data.bls.gov/cgi-bin/print.pl/oes/current/naics3_483000.htm) 01/22/2013

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13-1023	<a href="#">Wholesale, Retail, and Farm Products</a>	340	12.5%	0.56%	\$27.42	\$28.93	\$60,160	1.9%
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13-1041	<a href="#">Compliance Officers</a>	50	13.9%	0.08%	\$31.51	\$31.50	\$65,530	4.0%
13-1078	<a href="#">Human Resources, Training, and Labor Relations Specialists, All Other*</a>	360	8.5%	0.59%	\$26.67	\$28.60	\$59,480	2.8%
13-1081	<a href="#">Logisticians</a>	170	20.3%	0.28%	\$30.58	\$31.54	\$65,600	4.4%
13-1111	<a href="#">Management Analysts</a>	300	4.3%	0.49%	\$39.14	\$38.70	\$80,500	2.4%
13-1141	<a href="#">Compensation, Benefits, and Job Analysis Specialists</a>	40	11.2%	0.07%	\$32.95	\$33.44	\$69,560	4.2%
13-1151	<a href="#">Training and Development Specialists</a>	100	23.1%	0.16%	\$26.55	\$28.22	\$58,700	2.7%
13-1161	<a href="#">Market Research Analysts and Marketing Specialists*</a>	80	25.0%	0.13%	\$29.11	\$31.71	\$65,950	4.7%
13-1199	<a href="#">Business Operations Specialists, All Other*</a>	420	19.9%	0.68%	\$33.70	\$35.28	\$73,380	4.9%
13-2011	<a href="#">Accountants and Auditors</a>	780	9.5%	1.29%	\$31.09	\$33.52	\$69,720	4.0%

13-2051	<a href="#">Financial Analysts</a>		260	7.6%	0.42%	\$31.71	\$33.52	\$69,730	4.1%
13-2099	<a href="#">Financial Specialists, All Other</a>		40	22.2%	0.06%	\$29.06	\$30.48	\$63,400	8.0%
15-0000	<a href="#">Computer and Mathematical Occupations</a>	major	490	8.4%	0.80%	\$35.74	\$36.63	\$76,180	3.2%
15-1121	<a href="#">Computer Systems Analysts</a>		60	14.0%	0.09%	\$38.18	\$37.45	\$77,890	3.7%
15-1131	<a href="#">Computer Programmers</a>		60	8.3%	0.11%	\$43.17	\$45.36	\$94,350	3.9%
15-1141	<a href="#">Database Administrators</a>		50	23.6%	0.08%	\$37.28	\$39.92	\$83,040	7.2%
15-1142	<a href="#">Network and Computer Systems Administrators*</a>		100	18.9%	0.16%	\$36.54	\$36.90	\$76,750	2.7%
15-1150	<a href="#">Computer Support Specialists</a>		120	12.4%	0.20%	\$25.28	\$26.18	\$54,450	3.6%
15-1179	<a href="#">Information Security Analysts, Web Developers, and Computer</a>		50	14.1%	0.08%	\$39.38	\$38.56	\$80,190	3.7%

17-0000	<a href="#">Network Architects</a>	major	650	12.2%	1.07%	\$40.88	\$41.82	\$86,980	3.2%
17-2121	<a href="#">Marine Engineers and Naval Architects</a>		590	13.4%	0.97%	\$40.42	\$40.59	\$84,420	3.1%
19-0000	<a href="#">Life, Physical, and Social Science Occupations</a>	major	50	39.1%	0.09%	\$41.34	\$44.49	\$92,550	6.9%
23-0000	<a href="#">Legal Occupations</a>	major	70	39.4%	0.11%	\$48.13	\$57.92	\$120,470	9.0%
23-1011	<a href="#">Lawyers</a>		60	45.3%	0.10%	\$55.13	\$62.52	\$130,050	9.6%
27-0000	<a href="#">Arts, Design, Entertainment, Sports, and Media Occupations</a>	major	70	9.5%	0.11%	\$35.14	\$36.39	\$75,690	4.1%
27-3031	<a href="#">Public Relations Specialists</a>		50	7.7%	0.08%	\$39.23	\$39.84	\$82,870	3.2%
29-0000	<a href="#">Healthcare Practitioners and Technical Occupations</a>	major	70	21.8%	0.11%	\$32.82	\$31.73	\$65,990	3.3%

29-9011	<a href="#">Occupational Health and Safety Specialists</a>		50	29.5%	0.08%	\$34.05	\$33.88	\$70,460	3.7%
33-0000	<a href="#">Protective Service Occupations</a>	major	110	13.5%	0.18%	\$13.78	\$18.36	\$38,190	11.5%
33-9032	<a href="#">Security Guards</a>		80	15.2%	0.13%	\$12.94	\$14.48	\$30,110	5.3%
35-0000	<a href="#">Food Preparation and Serving Related Occupations</a>	major	2,680	13.9%	4.40%	\$14.45	\$15.33	\$31,880	3.8%
35-1011	<a href="#">Chefs and Head Cooks</a>		90	28.8%	0.14%	\$20.38	\$28.62	\$59,520	20.6%
35-1012	<a href="#">First-Line Supervisors of Food Preparation and Serving Workers</a>		420	26.4%	0.68%	\$17.32	\$18.69	\$38,880	5.9%
35-2012	<a href="#">Cooks, Institution and Cafeteria</a>		1,250	14.6%	2.05%	\$14.30	\$14.52	\$30,200	4.0%
35-2014	<a href="#">Cooks, Restaurant</a>		50	13.1%	0.07%	\$16.59	\$17.72	\$36,870	5.4%
35-2019	<a href="#">Cooks, All Other</a>		230	34.4%	0.38%	\$20.73	\$20.85	\$43,370	5.2%

35-2021	<a href="#">Food Preparation Workers</a>	100	16.0%	0.16%	\$11.04	\$12.05	\$25,070	3.7%
35-3021	<a href="#">Combined Food Preparation and Serving</a>	40	8.8%	0.06%	\$15.25	\$16.07	\$33,420	4.7%

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35-9021	<a href="#">Workers, Including Fast Food Dishwashers</a>	420	31.1%	0.69%	\$8.92	\$10.26	\$21,330	11.2%
35-9099	<a href="#">Food Preparation and Serving Related Workers, All Other</a>	40	21.4%	0.07%	\$11.02	\$12.50	\$26,000	11.9%

37-0000	<a href="#">Cleaning and Maintenance Occupations</a>	major	110	30.4%	0.19%	\$12.47	\$12.74	\$26,500	4.6%
37-2011	<a href="#">Janitors and Cleaners, Except Maids and Housekeeping Cleaners</a>		110	30.4%	0.19%	\$12.47	\$12.74	\$26,500	4.6%
39-0000	<a href="#">Personal Care and Service Occupations</a>	major	180	12.1%	0.30%	\$11.00	\$12.43	\$25,860	2.8%
41-0000	<a href="#">Sales and Related Occupations</a>	major	1,370	9.4%	2.24%	\$23.49	\$26.95	\$56,050	4.2%
41-1012	<a href="#">First-Line Supervisors of Non-Retail Sales Workers</a>		40	20.0%	0.07%	\$33.03	\$36.04	\$74,960	7.6%
41-2011	<a href="#">Cashiers</a>		80	18.9%	0.13%	\$11.64	\$12.50	\$26,000	7.5%
41-3041	<a href="#">Travel Agents</a>		190	34.6%	0.32%	\$11.42	\$19.27	\$40,090	29.8%
41-3099	<a href="#">Sales Representatives, Services, All Other</a>		790	11.4%	1.30%	\$25.69	\$28.27	\$58,800	4.9%

41-4012	<a href="#">Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific Products</a>		220	29.5%	0.37%	\$32.77	\$32.90	\$68,430	3.9%
43-0000	<a href="#">Office and Administrative Support Occupations</a>	major	8,610	6.7%	14.11%	\$16.68	\$18.24	\$37,940	3.9%
43-1011	<a href="#">First-Line Supervisors of Office and Administrative Support Workers</a>		680	10.9%	1.12%	\$25.79	\$27.10	\$56,360	3.8%
43-3011	<a href="#">Bill and Account Collectors</a>		80	29.6%	0.14%	\$20.66	\$24.29	\$50,530	8.4%
43-3021	<a href="#">Billing and Posting Clerks</a>		100	15.1%	0.16%	\$17.22	\$18.37	\$38,210	4.4%

[Bookkeeping,](#)

43-3031	<u>Accounting, and Auditing Clerks</u>	630	10.6%	1.03%	\$17.45	\$18.05	\$37,540	1.8%
43-3051	<u>Payroll and Timekeeping Clerks</u>	150	20.7%	0.25%	\$20.92	\$21.93	\$45,620	4.2%
43-4051	<u>Customer Service Representatives</u>	1,510	22.9%	2.48%	\$15.46	\$16.25	\$33,810	5.9%
43-4071	<u>File Clerks</u>	(8)	(8)	(8)	\$14.79	\$15.34	\$31,900	3.6%
43-4171	<u>Receptionists and Information Clerks</u>	140	14.1%	0.24%	\$13.74	\$14.81	\$30,810	3.0%
43-4181	<u>Reservation and Transportation Ticket Agents and Travel Clerks</u>	1,530	11.4%	2.52%	\$11.33	\$12.01	\$24,980	6.5%
43-5011	<u>Cargo and Freight Agents</u>	840	14.7%	1.37%	\$22.10	\$23.72	\$49,340	4.5%
43-5032	<u>Dispatchers, Except Police, Fire, and Ambulance</u>	390	19.9%	0.64%	\$18.15	\$20.29	\$42,210	4.6%
43-5061	<u>Production, Planning, and Expediting Clerks</u>	270	22.1%	0.44%	\$19.07	\$21.45	\$44,610	6.3%

43-5071	<u>Shipping, Receiving, and Traffic Clerks</u>	400	21.0%	0.66%	\$16.81	\$18.27	\$38,010	6.2%
43-5081	<u>Stock Clerks and Order Fillers</u>	60	14.2%	0.11%	\$13.38	\$14.54	\$30,240	6.0%
43-6011	<u>Executive Secretaries and Executive Administrative Assistants</u>	520	7.6%	0.86%	\$21.09	\$22.42	\$46,640	5.1%
43-6014	<u>Secretaries and Administrative Assistants, Except Legal, Medical, and Executive</u>	570	8.0%	0.93%	\$16.81	\$16.69	\$34,710	4.6%
43-9061	<u>Office Clerks, General</u>	540	11.0%	0.89%	\$15.23	\$16.39	\$34,100	4.0%
47-0000	<u>Construction and Extraction Occupations</u>	major 100	28.9%	0.16%	\$25.47	\$26.62	\$55,360	5.1%
47-2111	<u>Electricians</u>	100	28.9%	0.16%	\$25.47	\$26.62	\$55,360	5.1%
49-0000	<u>Installation, Maintenance, and Repair Occupations</u>	major 1,750	17.4%	2.88%	\$20.71	\$22.40	\$46,590	4.4%

49-1011	<u>First-Line Supervisors of Mechanics, Installers, and Repairers</u>	90	22.2%	0.14%	\$36.70	\$35.77	\$74,410	3.5%
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[http://data.bls.gov/cgi-bin/print.pl/oes/current/naics3\\_483000.htm](http://data.bls.gov/cgi-bin/print.pl/oes/current/naics3_483000.htm) 01/22/2013

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49-3031	<u>Bus and Truck Mechanics and Diesel Engine Specialists</u>	140	14.4%	0.22%	\$24.36	\$28.50	\$59,290	6.7%
49-3042	<u>Mobile Heavy Equipment Mechanics, Except Engines</u>	(8)	(8)	(8)	\$25.80	\$27.38	\$56,960	11.1%
49-3051	<u>Motorboat Mechanics and Service Technicians</u>	90	30.5%	0.15%	\$19.31	\$19.33	\$40,200	3.2%

49-9071	<u>Maintenance and Repair Workers, General</u>	640	15.5%	1.05%	\$17.33	\$18.80	\$39,100	4.0%
49-9092	<u>Commercial Divers</u>	(8)	(8)	(8)	\$26.16	\$25.13	\$52,270	11.7%
49-9096	<u>Riggers</u>	250	2.1%	0.41%	\$18.35	\$18.14	\$37,730	2.7%
51-0000	<u>Production Occupations</u>	major 510	34.5%	0.83%	\$18.76	\$21.39	\$44,490	5.3%
51-1011	<u>First-Line Supervisors of Production and Operating Workers</u>	(8)	(8)	(8)	\$30.78	\$31.00	\$64,480	6.8%
51-4121	<u>Welders, Cutters, Solderers, and Brazers</u>	260	21.1%	0.43%	\$19.76	\$22.24	\$46,260	5.6%
53-0000	<u>Transportation and Material Moving Occupations</u>	major 37,530	6.2%	61.56%	\$21.66	\$26.32	\$54,750	1.9%
53-1021	<u>First-Line Supervisors of Helpers, Laborers, and Material Movers, Hand</u>	170	23.2%	0.28%	\$27.62	\$29.02	\$60,360	4.2%
53-1031	<u>First-Line Supervisors of Transportation and Material-Moving Machine and Vehicle Operators</u>	500	10.2%	0.82%	\$30.22	\$31.18	\$64,850	3.1%
53-3032	<u>Heavy and Tractor-Trailer Truck Drivers</u>	(8)	(8)	(8)	\$13.83	\$15.63	\$32,500	6.1%
53-5011	<u>Sailors and Marine Oilers</u>	15,590	8.4%	25.57%	\$16.96	\$18.11	\$37,670	2.1%
53-5021	<u>Captains, Mates, and Pilots of Water Vessels</u>	12,650	5.5%	20.75%	\$29.26	\$33.68	\$70,040	2.7%
53-5022	<u>Motorboat Operators</u>	(8)	(8)	(8)	\$15.43	\$16.06	\$33,410	7.9%
53-5031	<u>Ship Engineers</u>	5,450	9.5%	8.95%	\$35.20	\$37.17	\$77,310	2.4%
53-6061	<u>Transportation Attendants, Except Flight Attendants</u>	540	11.3%	0.88%	\$11.45	\$12.49	\$25,990	4.0%
53-6099	<u>Transportation Workers, All Other</u>	100	10.0%	0.17%	\$18.27	\$17.88	\$37,190	9.5%
53-7021	<u>Crane and Tower Operators</u>	200	11.9%	0.34%	\$23.83	\$23.48	\$48,840	3.4%
53-7051	<u>Industrial Truck and Tractor Operators</u>	180	24.1%	0.30%	\$21.59	\$22.44	\$46,670	7.8%
53-7062	<u>Laborers and Freight, Stock, and Material Movers, Hand</u>	1,020	16.7%	1.67%	\$14.16	\$15.86	\$33,000	5.7%
53-7072	<u>Pump Operators, Except Wellhead Pumpers</u>	240	4.5%	0.39%	\$36.78	\$36.10	\$75,090	5.0%
53-7121	<u>Tank Car, Truck, and Ship Loaders</u>	60	40.3%	0.09%	\$17.10	\$17.09	\$35,540	3.2%

53-7199	<a href="#">Material Moving Workers, All Other</a>	(8)	(8)	(8)	\$9.01	\$11.33	\$23,560	13.4%
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[About May 2011 National Industry-Specific Occupational Employment and Wage Estimates](#)

(1) Estimates for detailed occupations do not sum to the totals because the totals include occupations not shown separately. Estimates do not include self-employed workers.

(2) Annual wages have been calculated by multiplying the hourly mean wage by a "year-round, full-time" hours figure of 2,080 hours; for those occupations where there is not an hourly mean wage published, the annual wage has been directly calculated from the reported survey data.

(3) The relative standard error (RSE) is a measure of the reliability of a survey statistic. The smaller the relative standard error, the more precise the estimate.

(5) This wage is equal to or greater than \$90.00 per hour or \$187,199 per year.

(8) Estimate not released.

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Other OES estimates and related information:

[May 2011 National Occupational Employment and Wage Estimates](#) (cross-industry estimates)

[May 2011 State Occupational Employment and Wage Estimates](#) (cross-industry estimates)

[May 2011 Metropolitan and Nonmetropolitan Area Occupational Employment and Wage Estimates](#) (cross-industry estimates)

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# Appendix F

## Databases, Tables & Calculators by Subject

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From: 2004 To: 2012 

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Data extracted on: January 22, 2013 (11:49:39 AM)  
**Employer Costs for Employee Compensation**

Series Id: CMU2020000520000D, CMU2020000520000P  
Compensation Component: Wages and salaries  
Employer/Employee Charac.: Transportation and material moving occupations industry Sector: Private

Download:  .xls

Year	Period	Cost of compensation (Cost per hour worked)	Percent of total compensation
2004	<a href="#">Qtr1</a>	<a href="#">13.21</a>	<a href="#">68.8</a>
2004	<a href="#">Qtr2</a>	<a href="#">13.20</a>	<a href="#">68.3</a>
2004	<a href="#">Qtr3</a>	<a href="#">13.37</a>	<a href="#">68.3</a>
2004	<a href="#">Qtr4</a>	<a href="#">13.43</a>	<a href="#">68.2</a>
2005	<a href="#">Qtr1</a>	<a href="#">13.43</a>	<a href="#">68.0</a>
2005	<a href="#">Qtr2</a>	<a href="#">13.59</a>	<a href="#">68.0</a>
2005	<a href="#">Qtr3</a>	<a href="#">13.70</a>	<a href="#">68.1</a>
2005	<a href="#">Qtr4</a>	<a href="#">13.68</a>	<a href="#">68.1</a>
2006	<a href="#">Qtr1</a>	<a href="#">13.63</a>	<a href="#">68.1</a>
2006	<a href="#">Qtr2</a>	<a href="#">13.72</a>	<a href="#">68.1</a>
2006	<a href="#">Qtr3</a>	<a href="#">13.84</a>	<a href="#">68.1</a>
2006	<a href="#">Qtr4</a>	<a href="#">14.50</a>	<a href="#">67.6</a>
2007	<a href="#">Qtr1</a>	<a href="#">14.54</a>	<a href="#">67.6</a>
2007	<a href="#">Qtr2</a>	<a href="#">14.79</a>	<a href="#">67.3</a>
2007	<a href="#">Qtr3</a>	<a href="#">14.89</a>	<a href="#">67.3</a>
2007	<a href="#">Qtr4</a>	<a href="#">14.98</a>	<a href="#">67.4</a>
2008	<a href="#">Qtr1</a>	<a href="#">15.18</a>	<a href="#">67.3</a>
2008	<a href="#">Qtr2</a>	<a href="#">15.24</a>	<a href="#">67.4</a>
2008	<a href="#">Qtr3</a>	<a href="#">15.36</a>	<a href="#">67.4</a>
2008	<a href="#">Qtr4</a>	<a href="#">15.16</a>	<a href="#">67.6</a>
2009	<a href="#">Qtr1</a>	<a href="#">15.28</a>	<a href="#">67.6</a>
2009	<a href="#">Qtr2</a>	<a href="#">15.37</a>	<a href="#">67.6</a>
2009	<a href="#">Qtr3</a>	<a href="#">15.53</a>	<a href="#">67.6</a>
2009	<a href="#">Qtr4</a>	<a href="#">15.58</a>	<a href="#">67.7</a>
2010	<a href="#">Qtr1</a>	<a href="#">15.68</a>	<a href="#">67.3</a>
2010	<a href="#">Qtr2</a>	<a href="#">15.70</a>	<a href="#">67.2</a>
2010	<a href="#">Qtr3</a>	<a href="#">15.88</a>	<a href="#">67.2</a>
2010	<a href="#">Qtr4</a>	<a href="#">15.43</a>	<a href="#">67.5</a>
2011	<a href="#">Qtr1</a>	<a href="#">15.44</a>	<a href="#">67.3</a>
2011	<a href="#">Qtr2</a>	<a href="#">15.50</a>	<a href="#">67.0</a>
2011	<a href="#">Qtr3</a>	<a href="#">15.58</a>	<a href="#">67.0</a>
2011	<a href="#">Qtr4</a>	<a href="#">15.63</a>	<a href="#">67.4</a>
2012	<a href="#">Qtr1</a>	<a href="#">15.79</a>	<a href="#">67.5</a>
2012	<a href="#">Qtr2</a>	<a href="#">15.84</a>	<a href="#">67.4</a>
2012	<a href="#">Qtr3</a>	<a href="#">15.98</a>	<a href="#">67.5</a>

TOOLS	CALCULATORS	HELP	INFO	RESOURCES
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<a href="#">Industries at a Glance</a>	<a href="#">Location Quotient</a>	<a href="#">FAQs</a>	<a href="#">Careers @ BLS</a>	<a href="#">Budget and Performance</a>

<a href="#">Economic Releases</a>	<a href="#">Injury And Illness</a>	<a href="#">Glossary</a>	<a href="#">Find It! DOL</a>	<a href="#">No Fear Act</a>
<a href="#">Databases &amp; Tables</a>		<a href="#">About BLS</a>	<a href="#">Join our Mailing Lists</a>	<a href="#">USA.gov</a>
<a href="#">Maps</a>		<a href="#">Contact Us</a>	<a href="#">Linking &amp; Copyright Info</a>	<a href="#">Benefits.gov</a>
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# Appendix G

## Four Sample Casualty Case Reviews

### Casualty Case Review Example 1

**Activity Number:** 1493713

**Vessel:** Bulk Carrier A.V. Kastner/Multiple Vessel Flotilla being pulled by Towing Vessel Swift

**Date:** 25-February-02

**Damages:** \$475,000

**Oil Spilled:** 12 barrels

**Deaths:** 4

**Injuries:** 1

#### Incident Brief from MISLE:

On 25 February 2002, at approximately 0644 local time, the 520 foot long bulk carrier A.V. KASTNER, O.N. L8605208, collided with a multiple vessel flotilla of dredging equipment, being pulled by the uninspected towing vessel BUCHANAN-14, O.N. 273851 and uninspected towing vessel SWIFT, O.N. 288602.

The collision occurred, in the vicinity of buoys G15 and R16 on the Elk River off Town Point, Maryland, near the entrance to the Chesapeake & Delaware (C&D) Canal. The vessels were operating in restricted visibility conditions as heavy fog had saturated the immediate area approximately ten minutes before the collision. In addition to the BUCHANAN-14, the flotilla consisted of vessels/equipment configured in the following order: the deck barge RC-811, O.N. 637743, the dredge vessel JEKYL ISLAND, O.N. 530846, the uninspected towing vessel SWIFT, O.N. 288602, the derrick/crane barge No. 4, the two tending vessels PUSHER 1 and PUSHER 10, and fourteen 500 foot sections of 24 inch diameter, plastic flexible dredge pipe. As a result of the collision, the tug SWIFT, was capsized with eight crewmen on board, and subsequently sank in approximately 35 feet of water. Four of the SWIFT's crew were safely recovered from the water and treated for various injuries and the remaining four were missing immediately following the casualty. The deck barge RC-811 sustained heavy damage and subsequently sank later in the day in approximate position 39-29.670 N 075-55.91 W. Following the casualty, the C&D Canal was closed to all vessel traffic pending the salvage of the SWIFT and the RC-811 and the removal of debris within the navigable channel.

A multi-agency search comprised of Coast Guard, state, and local response agencies, utilizing surface and airborne assets was conducted for the missing crewmen over the next two days with negative results. Active search efforts were officially suspended on the evening of 27 February 2002 due to the low probability of survival based on the current environmental conditions. Subsequently, the four crew were officially determined "missing and presumed dead". Post-casualty drug and alcohol testing was conducted on all individuals involved in this incident, the results of which are discussed later in this report. See Appendix D for the report.

On 2 March 2002, the SWIFT was raised at which time the bodies of the two of four the missing crewmen were recovered from inside the vessel. The bodies of the remaining two crewmen were discovered and retrieved from the water in the vicinity of Bohemia River approximately one month after the incident.

The A.V. KASTNER, BUCHANAN-14, SWIFT, the barge RC-811, and the dredge JEKYL ISLAND all sustained damage as a result of this incident. Specific details of the damage is described later in this report. All times indicated in this report are expressed as local, Eastern Standard Time, 24 hour clock.

#### Reviewer's Notes:

Although both the A.V. KASTNER and the BUCHANAN-14 had on board at the time of the incident, operating Global Positioning Navigation Equipment, (GPS), including a portable GPS device being operated by the pilot on board the A.V. KASTNER, neither of these devices were set up for the recording and recovery of historical track line data. The track lines of the vessels and their relative positions within the navigable channel leading up to the point of impact were determined based on information obtained during witness interviews, recorded radio transmissions, and calculations based on the location of items recovered from the debris field generated by the collision.

#### Part-Section Reference

- 164.43
- 164.46

## **Casualty Case Review Example 2**

**Activity Number:** 1687544

**Vessel:** Tug Grandma Gert/Tug Cynthia

**Date:** 05-October-02

**Damages:** \$78,882

**Oil Spilled:** None

**Deaths:** None

**Injuries:** 1

### **Incident Brief from MISLE:**

On 05OCT02, the tug GRANDMA GERT, transiting southbound and pushing ahead 1 empty and 22 loaded dry cargo barges, and the tug CYNTHIA, transiting southbound and pushing ahead five empty tank barges, were involved in a collision at mile 479 of the Lower Mississippi River. The tug GRANDMA GERT and the tank barge FMT-3080, sustained damage as a result of the collision. After the collision, the captain of the tug GRANDMA GERT assaulted a crewmember causing injuries.

### **Reviewer's Notes:**

The apparent cause of the collision was a failure by the operator of the tug GRANDMA GERT, to adhere to the Inland Navigation Rules.

### **Part-Section Reference**

- 164.43
- 164.46

### **Casualty Case Review Example 3**

**Activity Number:** 1494888

**Vessel:** Tug Eddie Touchette/Tug Miss Sylvia

**Date:** 17-March-02

**Damages:** \$110,000

**Oil Spilled:** None

**Deaths:** None

**Injuries:** None

#### **Incident Brief from MISLE:**

On 17MAR02, the UTV EDDIE TOUCHETTE and its tow of two red flagged barges loaded with crude oil, was pushed up on the RDB at Mile 161, LMR. The vessel had pushed up against the bank to wait for thick fog, which severely limited visibility, to clear. The M/V MISS SYLVIA and her tow of 6 hopper barges (two abreast, three deep) was upbound and the stbd bow of the barge AT182 (lead barge, port side) allided with the stern of the UTV EDDIE TOUCHETTE. The UTV EDDIE TOUCHETTE sustained damage to its stern hull, stern push knee, and deck. The AT182 sustained damage to stbd bow, push knee, and deck. No pollution or injuries occurred.

The operator of the UTV EDDIE TOUCHETTE, reported he saw the UTV MISS SYLVIA on radar and attempted several times unsuccessfully to make contact. The operator of the UTV MISS SYLVIA reported he stated his position for any possible southbound traffic and received no response/reply. His destination was Welcome Fleet located at Mile 161.5, RDB, LMR and as he began to steer towards the RDB to enter the fleet, he saw the UTV EDDIE TOUCHETTE pushed up against the bank.

#### **Reviewer's Notes:**

The apparent cause was as the UTV MISS SYLVIA began to steer towards the RDB, it allided with the UTV EDDIE TOUCHETTE that was pushed up against the bank. The root cause was poor visibility due to severe fog prohibited the UTV MISS SYLVIA from seeing the position of the UTV EDDIE TOUCHETTE. This case DCA per G-M Msg P042025Z OCT 01.

#### **Part-Section Reference**

- 164.43
- 164.46

#### **Casualty Case Review Example 4**

**MC Number:** MC98013656

**Vessel:** Tug Noema

**Date:** 19-September-98

**Damages:** \$0

**Oil Spilled:** None

**Deaths:** None

**Injuries:** None

#### **Incident Brief from MISLE:**

M/V NOEMA, 800hp vsl w/2 loads south bound in the Port Allen Route met the M/V LIL TUCKER w/5 barges. NOEMA was surprised to meet TUCKER since TUCKER had not answered radio hails. NOEMA went wide & fwd stb corner of his tow grounded. No explanation for why no comms were made between the vsls.

#### **Reviewer's Notes:**

The apparent cause was that communications in the Port Allen Route are frequently poor. Barge freed w/assist. No damage, no pollution, no actionable misconduct/neg suspected.

#### **Part-Section Reference**

- 164.43
- 164.46