SafeMTS Report on the Pilot

Safe
Maritime
Transportation
System

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SAFE MARITIME TRANSPORTATION SYSTEM

REPORT ON THE PILOT

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Executive Summary

This report describes results of a pilot effort to test the feasibility of establishing a near-miss reporting program for the U.S. maritime industry. The effort, titled SafeMTS (Safe Maritime Transportation System), is a collaboration between the Bureau of Transportation Statistics (BTS) and the Maritime Administration (MARAD), in partnership with the maritime industry. It aims to fill a gap in sharing of information on maritime precursor safety events, which can be used to develop preventive safety measures and lower the risk of more serious, or even catastrophic events. Stakeholders recognized the value and have expressed support for the development of such a program,[1] provided appropriate data protections are in place to ensure the confidentiality of sensitive near-miss data. To address these legal concerns, data collected for the pilot was protected by BTS under the Confidential Information Protection and Statistical Efficiency Act (CIPSEA), which prohibits BTS from disclosing information in identifiable form for any non-statistical purpose without the informed consent of the data provider.[2] Data collected under CIPSEA are immune from legal discovery and subpoena and cannot be released under the Freedom of Information Act (5 U.S.C. § 522).

Seven maritime companies participated in the pilot by sharing sample near-miss records, working with BTS and MARAD to identify the scope of data that should be submitted to ensure data captured has appropriate learning value, and contributing to the development of the pilot "data key"—a set of baseline core data fields and values necessary for the collection of meaningful information about a near-miss event. An evaluation and summary of the pilot dataset, comprising 7,222 near-miss and hazard recognition events occurring between 2020 and 2022, is presented in this report as an illustration of analytics to be developed for the full program.

[1] See statements of support from industry members in Appendix E, and letter of support from the National Transportation Safety Board in Appendix F.

[2] Title III of the Foundations for Evidence-Based Policymaking Act of 2018, Pub. L. 115-435.

In developing and analyzing the pilot dataset, differences between companies were observed in the data elements collected, record completeness, and data definitions. Recommendations were developed related to these challenges, with the goals of ensuring data can be properly aggregated and ensuring data is sufficiently complete and robust to generate learning value. An important recommendation to be considered for the full program is harmonizing the definition of type of event (i.e., a near miss versus a lesser precursor event such as hazard identification), to allow for trend identification and valid comparisons when aggregating events across companies. In general, the SafeMTS program once implemented is expected to contribute to improved consistency in data definitions across the maritime industry through continued work and engagement with stakeholders on the data key.

Although based on a limited pilot dataset and therefore not representative of the entire maritime industry, observations from the pilot can represent the type of learnings that could be expected from the program once fully implemented. For example, "being lucky" was commonly cited as a reason for not being injured by a dropped object, which could indicate a lack of structured preventive measures. These measures, such as following proper procedure or using personal protective equipment, can counteract the human bias towards optimism and perceived control over the hazards and risk of an operation.

Learnings from the pilot effort, together with artifacts such as the data key, provide a foundation for the development of a full-scale SafeMTS program. A proposed governance and high-level operational structure for the full program, described in this report, is informed by three foundational requirements for a voluntary maritime near-miss reporting program: (1) robust protections for industry-provided data, (2) public sector involvement to support the development and operations, and (3) high levels of industry engagement. BTS and MARAD will define a phased growth plan for the next two years to grow the program at a rate matching available resource levels. The first phase of the full program will identify the subset of core data fields that most potential participants collect and are able to provide, based on learnings from the pilot. Subsequent phases will include the collection of additional data fields, based on research and discussion with stakeholders. As more complete data is collected and aggregated results become available, BTS and MARAD will work with stakeholders to identify ways to use their data to develop preventive safety actions.

1 Introduction

This report represents the culmination of the pilot phase of SafeMTS (Safe Maritime Transportation System), a near-miss data collection program for the maritime industry. The pilot was designed and implemented through a collaborative partnership between the Bureau of Transportation Statistics (BTS) and the Maritime Administration (MARAD), with the assistance of seven maritime industry companies who expressed interest in contributing to the effort. Following an overview of the overarching SafeMTS goals and rationale, the report discusses the process for developing the pilot, results of the pilot data analysis, lessons learned through the process, and planned next steps as the program moves beyond the pilot phase.

1.1 Identifying the Need

Near-miss safety events in the maritime industry are an important source of precursor safety information, i.e., events with the potential for, but not resulting in, adverse safety consequences. Precursor information can be used to develop preventive measures and lower the risk of more serious, or even catastrophic events. The benefit of data collection and analysis in this area has been recognized in numerous studies, National Academies publications, reports, and articles.[3] Additionally, several precursor safety data sharing programs have been established within the transportation and energy sectors, such as the Aviation Safety Reporting Program for the aviation industry, the Confidential Close Call Reporting System for the railroad industry, the WMATA Confidential Close Call Reporting Program for transit, and the SafeOCS Program for the offshore oil and gas industry.

Currently, no industry-wide reporting or data sharing program is in place in the United States for maritime near-miss events. Marine casualties and other consequential incidents are reportable via regulations under the jurisdiction of either the Occupational Safety and Health Administration (OSHA) or the U.S. Coast Guard (USCG); however, near-miss events are not

[3] See, e.g., (1) International Maritime Organization (2008), Guidance on Near-Miss Reporting, MSC-MEPC.7/Circ. 7; (2) National Academy of Engineering (2004), Accident Precursor Analysis and Management: Reducing Technological Risk Through Diligence, https://doi.org/10.17226/11061.

required to be reported under current regulations. Many maritime companies voluntarily collect and analyze near-miss events that occur within their own organizations, as recommended by the International Maritime Organization (IMO) under the International Safety Management (ISM) Code.[4] These events are captured through each company's safety management system (SMS).[5]

Developing a unified data source by collecting near-miss event data from participating companies will allow for analysis and dissemination of key findings to industry. These findings can be used to increase awareness of safety issues, as well as inform amendments to safety protocols, procedures, equipment and vessel design, waterway management, and operational or maintenance plans and policies to prevent adverse events.

1.2 Building on Previous Maritime Near-Miss Data Efforts

The maritime sector has been pursuing a robust near-miss reporting system for almost 30 years. Milestones include a prior collaborative near-miss reporting program, the development and publication of a standard for near-miss reporting, and stakeholder working group efforts, discussed further below.

The International Maritime Information Safety System (IMISS), a voluntary data sharing program for national and international maritime safety trends and lessons learned, was pursued in the mid-1990s. The USCG, MARAD, and industry worked together to develop the IMISS concept with the goal of identifying system vulnerabilities before failures or accidents occurred. However, legal and confidentiality concerns, including the potential for regulatory enforcement action arising from near-miss reporting, prevented the program from moving forward.

In 2016, ASTM International's Committee on Ships and Marine Technology (Committee F25) formed a task group to develop a standard in an effort to harmonize near-miss data reporting

[4] The ISM Code is codified for certain U.S. flagged vessels under 33 C.F.R part 96.

[5] Towing vessel operators, for example, typically implement a USCG-approved Towing Safety Management System (TSMS). See 46 C.F.R. part 138.

and benchmarking. This effort, led by the American Bureau of Shipping (ABS) and Lamar University, resulted in the development and publication of the Standard Guide for Reporting and Recording of Near-Misses for Maritime Industry, ASTM F3256. Internationally, the IMO's Sub-Committee on Implementation of IMO Instruments (III) established working groups to promote consistency for marine safety investigation reports, data elements for Global Integrated Shipping Information System (GISIS) casualty reporting requirements, and human factors applications, among other topics related to marine incidents.

In 2020, the Ship Operations Cooperative Program's (SOCP) safety and health working group began an effort to evaluate how the industry could advance the quality and availability of maritime near-miss data. The SOCP team gathered information on various maritime and other industry reporting systems (such as SafeOCS, the confidential reporting system administered by BTS and sponsored by the Bureau of Safety and Environmental Enforcement to advance safety in oil and gas operations on the outer continental shelf), data collection tools, and potential improvements to data fields, definitions, and guidance. In addition, the SOCP team talked with domestic operators regarding issues that could prohibit their participation. This input informed the design of the SafeMTS pilot.

2 The SafeMTS Pilot

Although maritime near-miss reporting programs exist within industry associations and individual companies, these efforts are not harmonized, as they reflect each company's unique data environment. This gap represented an opportunity for MARAD and industry to collaborate on an approach to establish an industrywide near-miss data sharing program, supplementing existing near-miss data collection efforts and enabling stakeholders to gain insights from a broader range of safety events. Members of the industry, as well as other stakeholders including the National Transportation Safety Board, have expressed support for such a program (see statements of support in Appendices E and F).

2.1 Initiating the Pilot

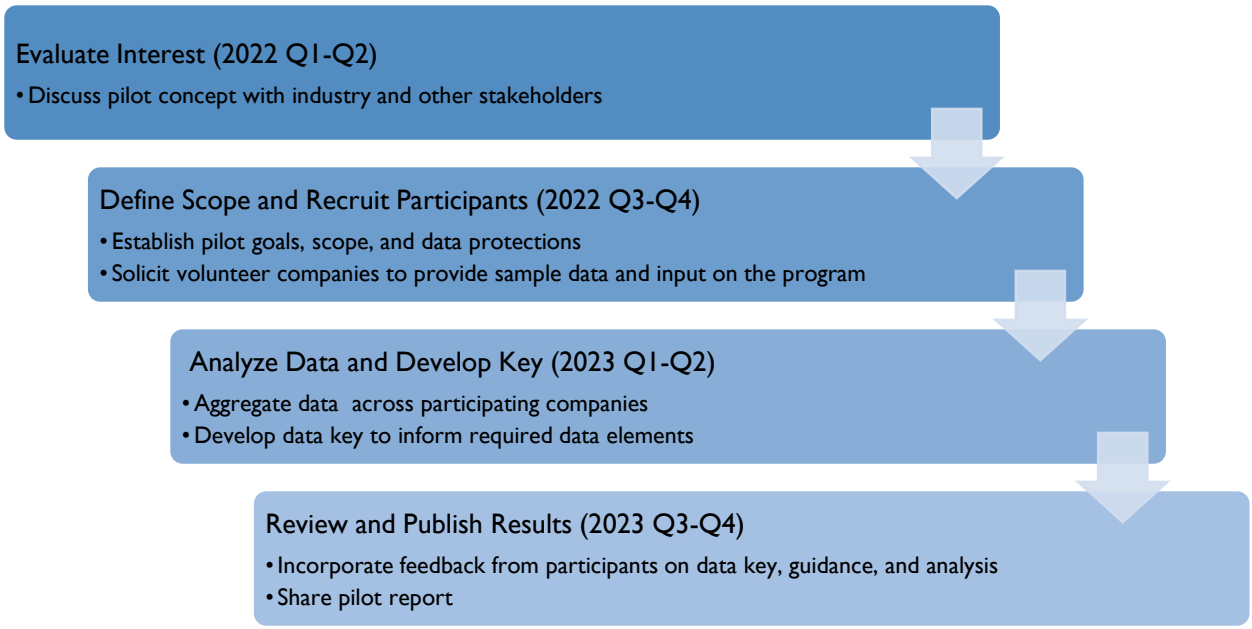
In 2022, MARAD, in partnership with industry, embarked on a pilot initiative to develop and demonstrate an industrywide maritime near-miss reporting program and its potential safety benefits. To address legal concerns among companies about sharing sensitive near-miss data, MARAD approached BTS to serve as the data steward for the effort. As the only principal federal statistical agency in DOT, BTS has the authority to collect data confidentially for statistical purposes under the Confidential Information Protection and Statistical Efficiency Act (CIPSEA).[6] Information protected under CIPSEA may not be used for regulatory purposes and is protected from Freedom of Information Act (FOIA) requests, subpoenas, and legal discovery. BTS has developed and operated confidential near-miss reporting systems for the offshore oil and gas industry, railroad, and transit industries.

A working group was established with representatives from MARAD, BTS, the USCG, and the Department of the Interior's Bureau of Safety and Environmental Enforcement (BSEE). The USCG and BSEE provided input on the design and development of the pilot. Following working group meetings and discussions with industry, MARAD and BTS initiated efforts to recruit companies interested in participating in the pilot, with the objective of ensuring representation

[6] Title III of the Foundations for Evidence-Based Policymaking Act of 2018, Pub. L. 115-435.

from across the maritime industry, including operators of tug and barge vessels, research vessels, tankers, containerships, and passenger vessels, among others. Seven companies agreed to participate as early implementers. These companies agreed to provide sample data, work with BTS and MARAD to identify the scope of data that would ensure appropriate learning value, and contribute to the development of resources such as narrative guidance. A summary of milestones is shown below.

Figure 1: Summary of Pilot Milestones



SOURCE: USDOT, Bureau of Transportation Statistics, SafeMTS Program.

2.2 Defining the Core Data Fields

A key objective of the pilot was to identify core data fields needed for a robust near-miss database. Through scheduled meetings, ad hoc input from participants, discussions with industry groups, and input from independent industry subject matter experts (SMEs), baseline core data fields were identified and incorporated into a "data key"—a set of variables and values necessary for the collection of meaningful information about a near-miss event. Arriving at a cohesive product involved a detailed discussion of each proposed data field to ensure that the information captured would enable safety insights and allow for the identification of measures to prevent more serious incidents.

The core data fields, shown in Figure 2, are based both on the pilot participants' data as well as SME recommendations and review of relevant standards and publications.[7] Appendix A provides a more detailed listing of the values (i.e., drop-down menu choices) for each field. Importantly, the key is envisioned to be a living document that is periodically revised as more and varied data is shared and safety issues and trends are identified.

Figure 2: SafeMTS Core Data Fields

SOURCE: USDOT, Bureau of Transportation Statistics, SafeMTS Program.

[7] A partial list of standards and publications consulted include:

- ASTM Standard Guide for Reporting and Recording of Near-Misses for Maritime Industry, July 2017. DOI: 10.1520/F3256-17.
- Human Factors Analysis and Classification System (HFACS) Framework
- American Waterways Operators Near Miss Form
- DNV GL Marine Systematic Cause Analysis Technique (M-SCAT 8.2)
- National Commission on Military Aviation Safety, Report to the President and the Congress of the United States, Dec. 1, 2020.
- OCIMF Tanker Management and Self-Assessment (TMSA), Element 8 Incident Reporting, Investigation and Analysis.

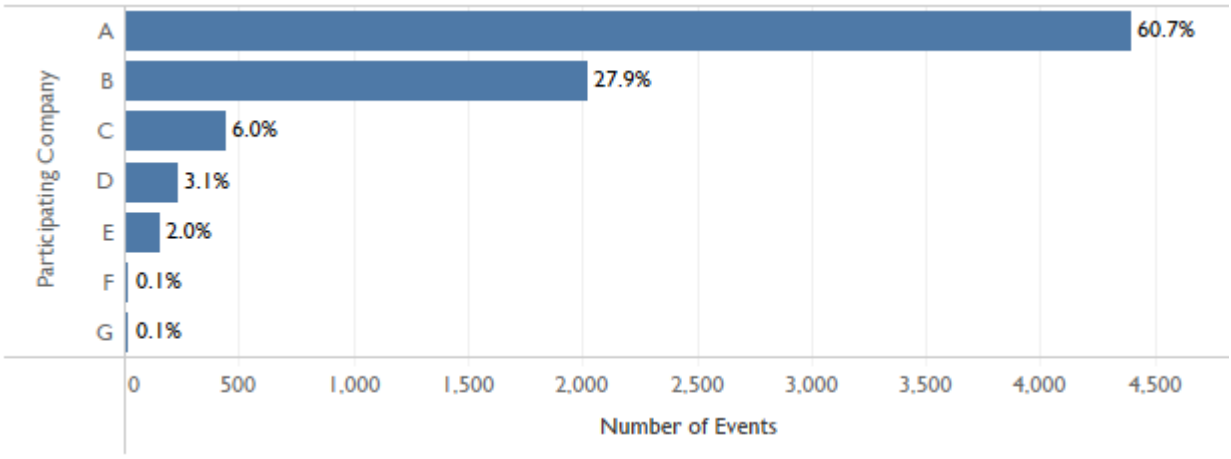
3 Pilot Data Profile

For the pilot, seven companies submitted data on more than 15,000 near-miss and hazard recognition events occurring between January 1, 2016, and January 31, 2023. For purposes of this report, to allow for better coverage of the different industry sectors as well as lower the risk of reidentification, the analytical dataset is limited to calendar years with representation from multiple companies. The final pilot dataset includes 7,222 near-miss and hazard recognition events occurring between January 1, 2020, and December 31, 2022. It is important to note that the results, trends, and observations shown are based only on this limited pilot dataset and should not be interpreted as representative of the entire maritime industry. Rather, this section represents an illustration of analytics to be developed when a sufficient sample of data providers fully participate in SafeMTS.

3.1 Reporting Frequency

Two companies contributed the majority of records to the pilot dataset, as shown in Figure 3. The median number of events per quarter varied between the seven companies, with two companies recording a median of more than 100 events per quarter, and three companies with a median of less than 10 events per quarter (see Figure 4). The observed skewed distribution can be partially attributed to limitations of the pilot dataset. As the program grows, this type of analysis can be refined to include additional data points, such as the average number of events

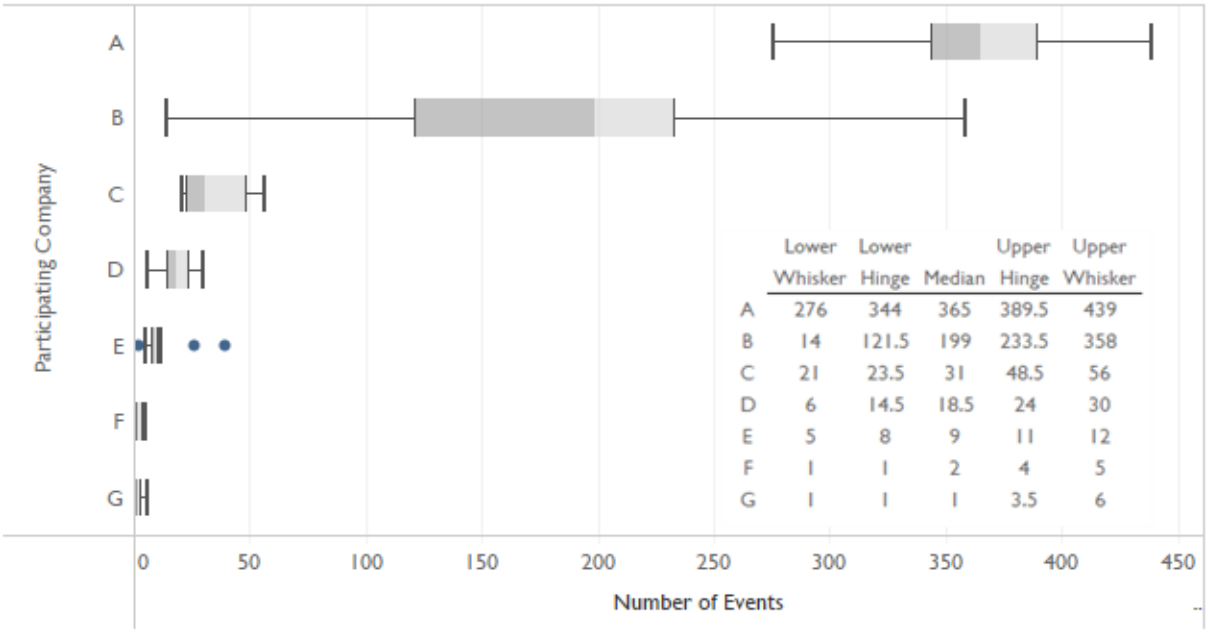
Figure 3: Events per Company (n=7,222)



SOURCE: USDOT, Bureau of Transportation Statistics, SafeMTS Program.

per vessel, for example. Differences in the number of events per company in the pilot dataset can also be partially attributed to differences in how each company defines a near miss, as well as how readily accessible a company's data was in their internal system. Some companies included hazard recognition events (i.e., safety observations) found during rounds, leading to a higher number of events relative to those companies applying a narrower definition.

Figure 4: Events Per Quarter, by Company



	Lower Whisker	Lower Hinge	Median	Upper Hinge	Upper Whisker
A	276	344	365	389.5	439
B	14	121.5	199	233.5	358
C	21	23.5	31	48.5	56
D	6	14.5	18.5	24	30
E	5	8	9	11	12
F	1	1	2	4	5
G	1	1	1	3.5	6

NOTE: Calculated using the Tukey method.
SOURCE: USDOT, Bureau of Transportation Statistics, SafeMTS Program.

3.2 Core Data Field Analysis

To allow for aggregation across companies, each company's submitted data fields and values were mapped to the SafeMTS core data fields. Where useful, text mining techniques were applied to extract discrete data elements, such as vessel types, from narrative information. Values for core data fields were also extracted from narrative information through manual SME review. Meetings were held with each company to ensure proper understanding and mapping of their data. Quality checks were performed to eliminate any duplicate entries and confirm data files were processed in a standardized manner. The remaining data analysis presented in this report is based on the current version of the SafeMTS data key (Appendix A), with some

further aggregation required due to the low number of events in certain categories in the pilot dataset.

Data completeness, regarding both the number of core data fields provided and the percent of events with a structured value for each core data field, varied across participating companies. Some companies have only a few data fields and rely primarily on narrative descriptions to capture important safety information, and other companies supplement these descriptions with standardized drop-down fields. For most core data fields, less than half of participating companies provided values in structured, non-free text form (see left side of Table 1). However, the narrative information was sufficient to derive structured values for most of these data fields (see right side). Overall, Table 1 shows how additional information for each core data field could be derived through BTS data processing and analysis. For example, for all companies, information on incident type and near miss classification was either provided or could be derived through review. Information on potential severity level could also be derived from narrative information, but not as successfully as some of the other core data fields.

Table 1: Is Information Provided with Structured Values (Non-Free Text)?

	IN ORIGINAL FILES								IN ORIGINAL FILES OR DERIVED THROUGH REVIEW							
Company	*(1)*	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*		*(1)*	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	
Incident Type/Category		Y	Y	Y		Y		57%	Y	Y	Y	Y	Y	Y	Y	100%
Near Miss Classification		Y	Y	Y				43%	Y	Y	Y	Y	Y	Y	Y	100%
Geographic Location		Y		Y				29%	Y	Y	Y	Y	Y		Y	86%
Vessel Type	Y	Y		Y	Y			57%	Y	Y	Y	Y	Y	Y	Y	100%
Location on Vessel		Y		Y				29%	Y	Y	Y	Y	Y	Y	Y	100%
Operations/Activity Ongoing		Y		Y			Y	43%	Y	Y	Y	Y	Y	Y	Y	100%
System/Equipment Involved		Y						14%	Y	Y	Y	Y	Y	Y	Y	100%
Observing Personnel Type					Y			14%	Y	Y	Y	Y	Y	Y	Y	100%
Factor Preventing Worse Incident		Y						14%	Y	Y	Y	Y	Y	Y	Y	100%
Immediate Corrective Action								0%	Y	Y	Y		Y	Y		71%
Potential Consequence		Y		Y				29%	Y	Y	Y	Y	Y	Y	Y	100%
Potential Severity Level	Y			Y	Y			43%	Y	Y		Y	Y			57%
Causal/Contributing Factors								0%	Y	Y			Y		Y	57%
Root Cause								0%		Y			Y		Y	43%

NOTE: "Y" = yes. The calculated columns reflect the percent of companies (number of "Y" values / 7). For confidentiality, companies are labeled as (1), (2), etc.
SOURCE: USDOT, Bureau of Transportation Statistics, SafeMTS Program.

Regarding completeness of values for each data field, several data fields were 100 percent complete (i.e., zero blank values) without additional manual review required, including event date, event description, and action taken-narrative. Most data fields, however, required manual SME review to extract discrete values. Table 2 shows the completeness of each structured (non-free text) data field following SME review. Following this review, more than half of records in the pilot dataset included the incident type/category, near miss classification, vessel type, location on vessel, operations/activity ongoing, or factor preventing worse incident, while few records included structured causal information. Importantly, not all events received further SME review, which could explain the lower end of the ranges shown. For eight of these data fields, the median percent completeness by company was greater than 80%, meaning that most of the pilot data providers collect this information and were able to provide it to SafeMTS. This analysis can inform a phased growth plan for SafeMTS, discussed further in section 5 of this report, which would focus at the start on an abbreviated set of core data fields that can be provided directly or derived for most potential participants.

Table 2: How Complete Is Each Structured Data Field?

	Percent Complete	BY COMPANY	
		Range	Median
Incident Type/Category	95%	(12%-100%)	100%
Near Miss Classification	56%	(2%-100%)	83%
Geographic Location	9%	(0%-100%)	20%
Vessel Type	72%	(0%-100%)	97%
Location on Vessel	57%	(4%-100%)	89%
Operations/Activity Ongoing	55%	(2%-100%)	98%
System/Equipment Involved	43%	(2%-100%)	91%
Observing Personnel Type	8%	(2%-100%)	67%
Factor Prev. Worse Incident	53%	(2%-100%)	98%
Immediate Corrective Action	4%	(0%-98%)	2%
Potential Consequence	16%	(2%-100%)	100%
Potential Severity Level	13%	(0%-100%)	4%
Causal/Contributing Factors	5%	(0%-100%)	1%
Root Cause	1%	(0%-80%)	0%

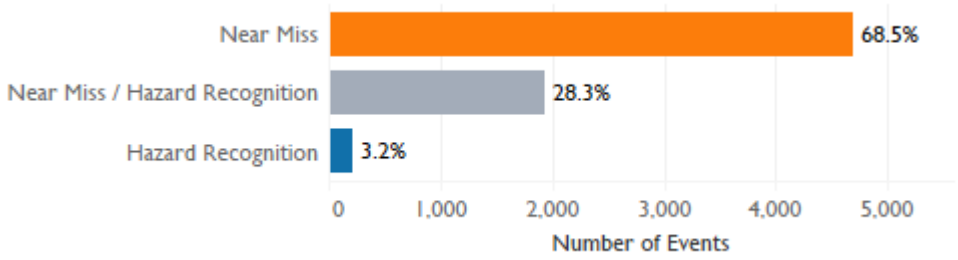
NOTE: Percent complete = number of records with a structured value (either provided directly or extracted from narrative information) divided by the total records in the pilot dataset (7,222). Each record denotes a single event.
SOURCE: USDOT, Bureau of Transportation Statistics, SafeMTS Program.

For the remainder of the results shown in this section, events without a reported value for the data field(s) shown are excluded. The total number of events included in each plot is noted in the figure heading.

3.3 Incident Type and Near Miss Classification

As shown in Figure 5, most submitted events with an incident type category were classified as near misses (68.5 percent). Some companies grouped near miss and hazard recognition together, and a smaller number of events (220) were categorized as hazard recognition. Some of these 220 events were found during rounds or inspection. For future analysis, a third category could be considered: Undesired Event (Negative Business Impact). This category would include events with potential business impacts, such as a schedule delay caused by cargo or mooring issues. Some companies captured these types of events in submitted data but classified them as near misses.

Figure 5: Incident Type/Category (n=6,843)



SOURCE: USDOT, Bureau of Transportation Statistics, SafeMTS Program.

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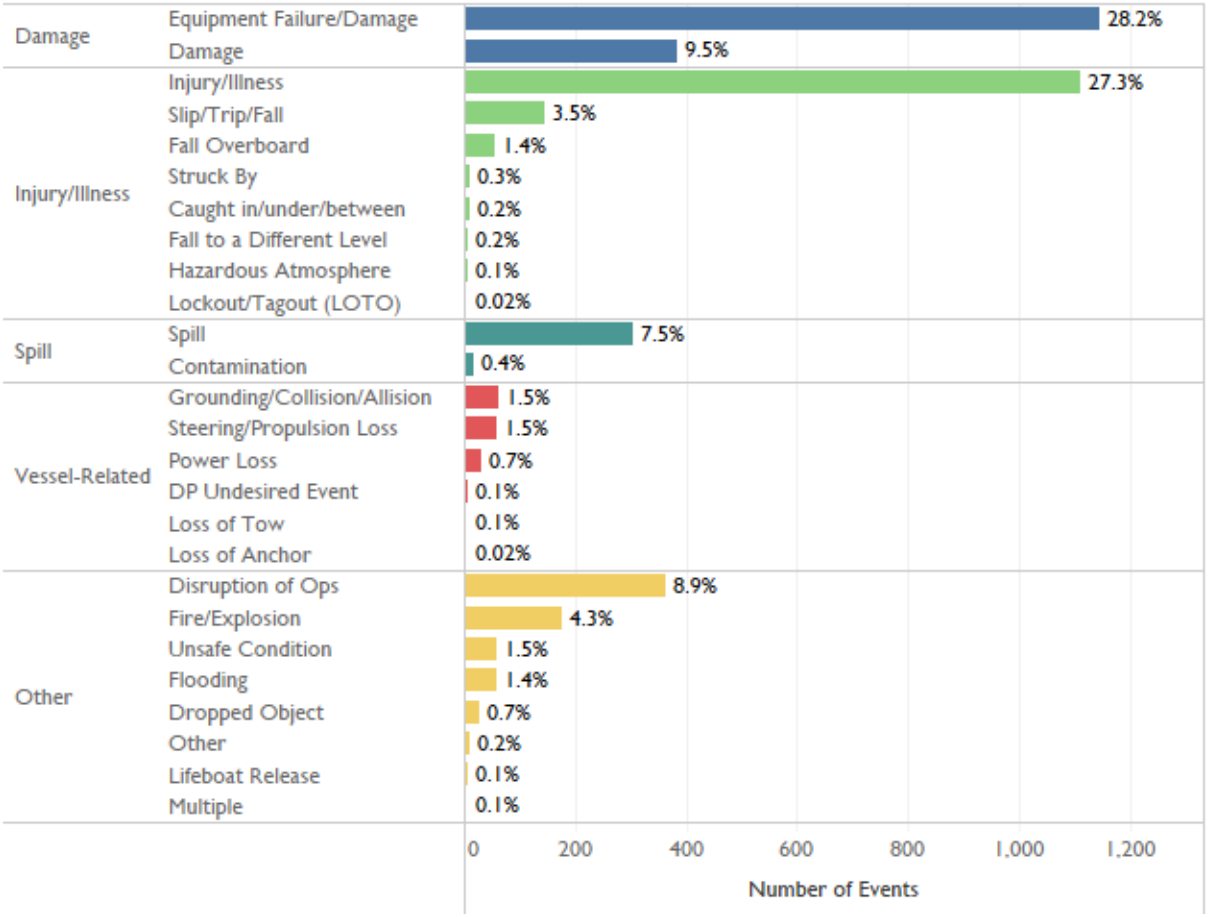
Near miss classification (Figure 6) is used to reflect an event's primary theme or topic, and often is its most salient potential consequence. Most events (55.5 percent) were classified as either equipment failure/damage or injury/illness. Damage is distinct from equipment failure/damage in that damage should involve property other than equipment; however, this distinction is inconsistently applied, leading to some ambiguity in the data. For future analysis, it is proposed to separate damage into four distinct categories: cargo damage, equipment damage, property damage, and structural damage.

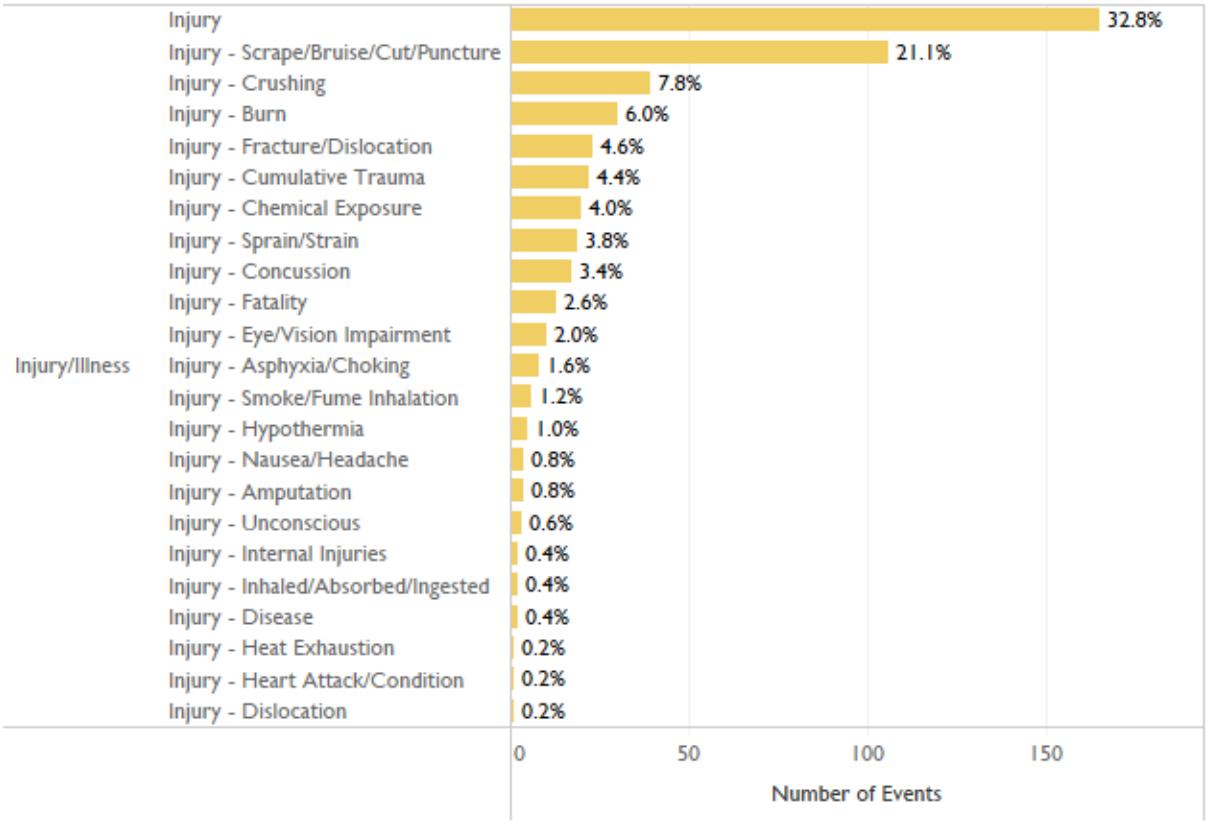
Figure 6: Near Miss Classification (n=4,067)



NOTE: Events classified as other (0.2%) include safety meeting report, securing equipment/cargo, and missing electrical guards.
SOURCE: USDOT, Bureau of Transportation Statistics, SafeMTS Program.

While the near miss classification generally represents the predominant potential outcome of an event, many events listed additional potential consequences, shown in Figure 7 and Figure 8. Of the 1,154 events with information on potential consequences those, about half (503) reported a potential consequence related to some type of injury (Figure 7). Most of these events (32.8 percent) did not specify the type of injury that could have occurred.

Figure 7: Events with Potential Injury (n=503)



SOURCE: USDOT, Bureau of Transportation Statistics, SafeMTS Program.

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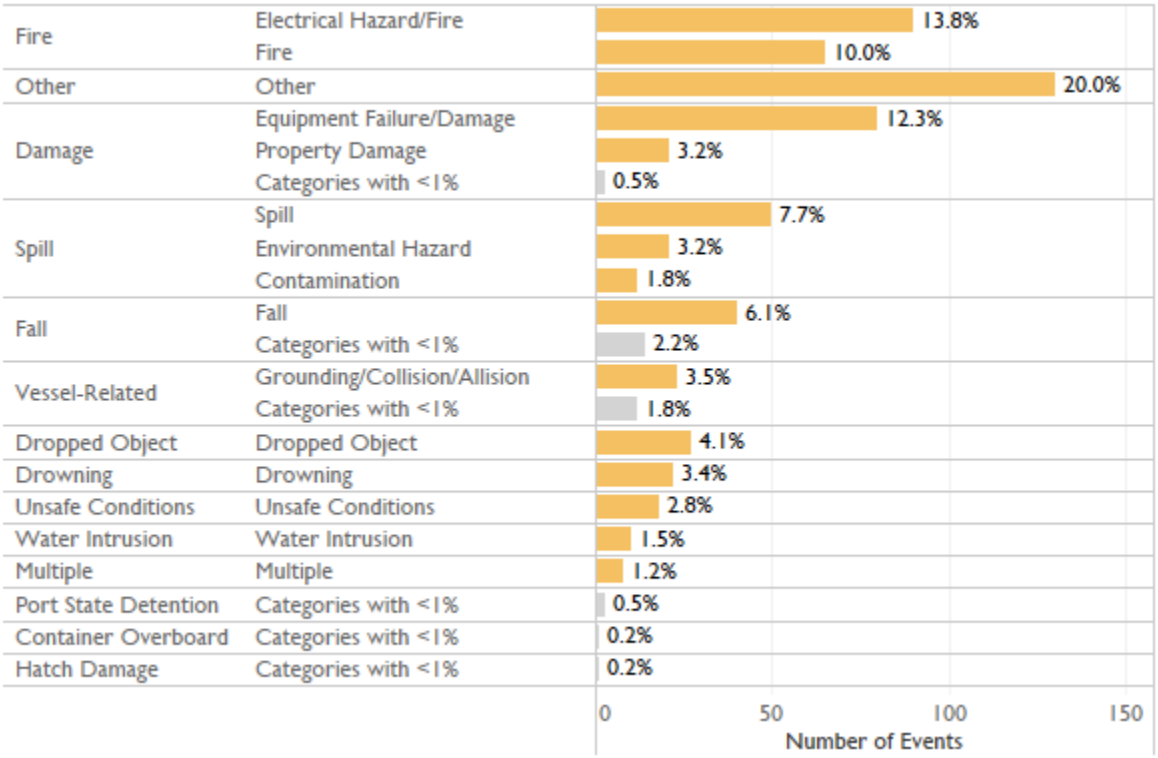
Figure 8 shows potential consequences reported other than injuries. Among these, electrical hazards and fire were more commonly cited relative to other specified values. The most prevalent issue in the fire category was electrical—shorts, grounds, and loose connections. When causal factors were listed on these cases, they were most often equipment/material damage or failure to follow procedures. In many cases, accommodation spaces such as the laundry or kitchen area were impacted, and situational awareness (often noticing unusual smells) played a role in preventing a worse incident.

Figure 8: Other Potential Consequences (n=651)



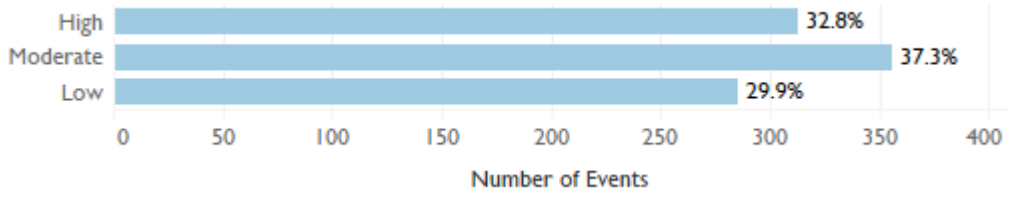
NOTE: Events classified as other (20.0%) were specifically labeled as "other" by the data provider.
SOURCE: USDOT, Bureau of Transportation Statistics, SafeMTS Program.

Some companies strictly limit their collection of near-miss information to those events without any actual consequences, while others include events of minimal consequence or consequence below a specified threshold. For example, an incident may have the potential for contamination, damage, or spill, but resulted in an actual consequence of a minor injury. Narrative information on actual consequences was noted for 68 events. The most frequently cited were damage to equipment and property, lost time, and spills. Additional discussion is needed with industry to

determine the appropriate threshold for considering an event as a near miss, the results of which could be incorporated into a future guidance publication.

Some companies label more significant near-miss events as high potential consequence, captured in the SafeMTS pilot dataset as potential severity level. This information was available for 954 incidents, summarized in Figure 9. Potential severity is determined by the company, and companies may define severity levels differently. This represents another potential opportunity for better data quality by standardizing definitions. Most of the incidents listing this information were categorized as moderate severity level (37.3 percent of events with information on potential severity level), though as shown in Figure 9, there was a fairly even distribution of severity level across the 954 incidents. Three events reported as potentially catastrophic are grouped within the high severity level due to differences between companies in how they distinguished between catastrophic and high.

Figure 9: Potential Severity Level (n=954)



SOURCE: USDOT, Bureau of Transportation Statistics, SafeMTS Program.

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Table 3 shows the near-miss classification associated with events labeled as high potential severity, for those events with information on near-miss classification. In addition to equipment failure and injury/illness, more events with high potential severity were reported for fire/explosion, dropped object, and unsafe condition relative to other event types.

Table 3: Hazards Associated with High Potential Events (n=106)

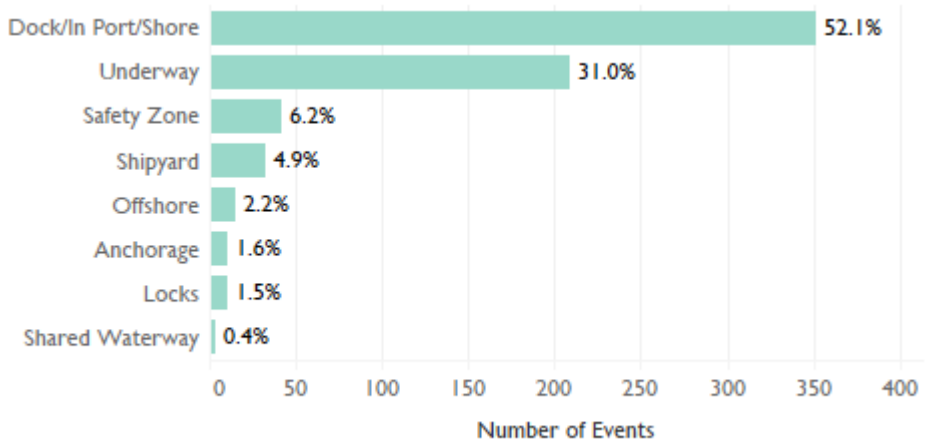
		Number of Events
Damage	Equipment Failure/Damage	16
	Damage	6
Injury/Illness	Injury/Illness	12
	Slip/Trip/Fall	6
	Fall Overboard	5
	Struck By	4
	Hazardous Atmosphere	1
Spill	Spill	8
	Contamination	1
Vessel-Related	Power Loss	1
	Grounding/Collision/Allision	1
Other	Fire/Explosion	20
	Dropped Object	11
	Unsafe Condition	10
	Lifeboat Release	2
	Flooding	1
	Disruption of Ops	1
Grand Total		106

NOTE: Categories reflect the event's near-miss classification.
SOURCE: USDOT, Bureau of Transportation Statistics, SafeMTS Program.

3.4 Location and Vessel Type

In the SafeMTS data key, geographic location reflects the location of the vessel or event, such as underway or in port. As shown in Figure 10, geographic location was not commonly reported. More than half of events noting the geographic location occurred while the vessel was in port. Some companies also reported more specific geographic locations, such as the country, port, or body of water, and weather information, which can inform analysis of whether additional controls are needed for operations occurring in places where environmental factors have contributed to near-miss events. Given the differing definitions and availability of this information across companies, additional review and refinement of this core data field is planned for the future.

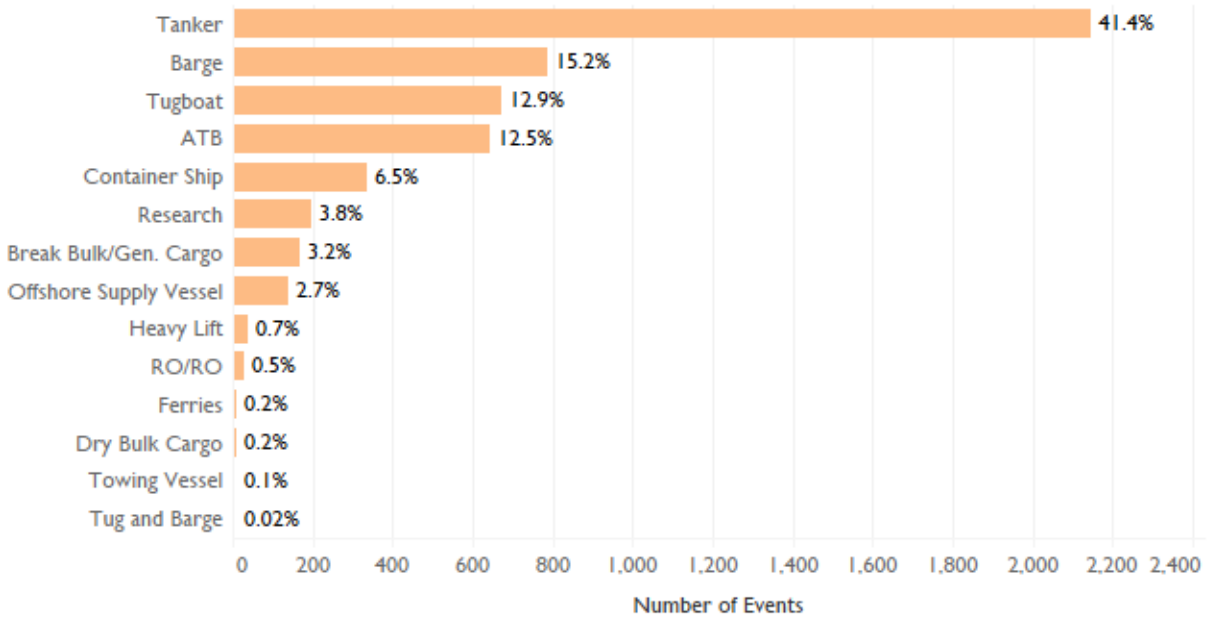
Figure 10: Geographic Location (n=675)



SOURCE: USDOT, Bureau of Transportation Statistics, SafeMTS Program.

As shown in Figure 11, many events in the pilot dataset involved tugboats and barges. Tankers were the most common vessel type, primarily due to the fleet makeup of one of the higher-contributing SafeMTS participants. A small number of events (63) involved two vessels, typically a tug and a barge.

Figure 11: Vessel Type (n=5,176)

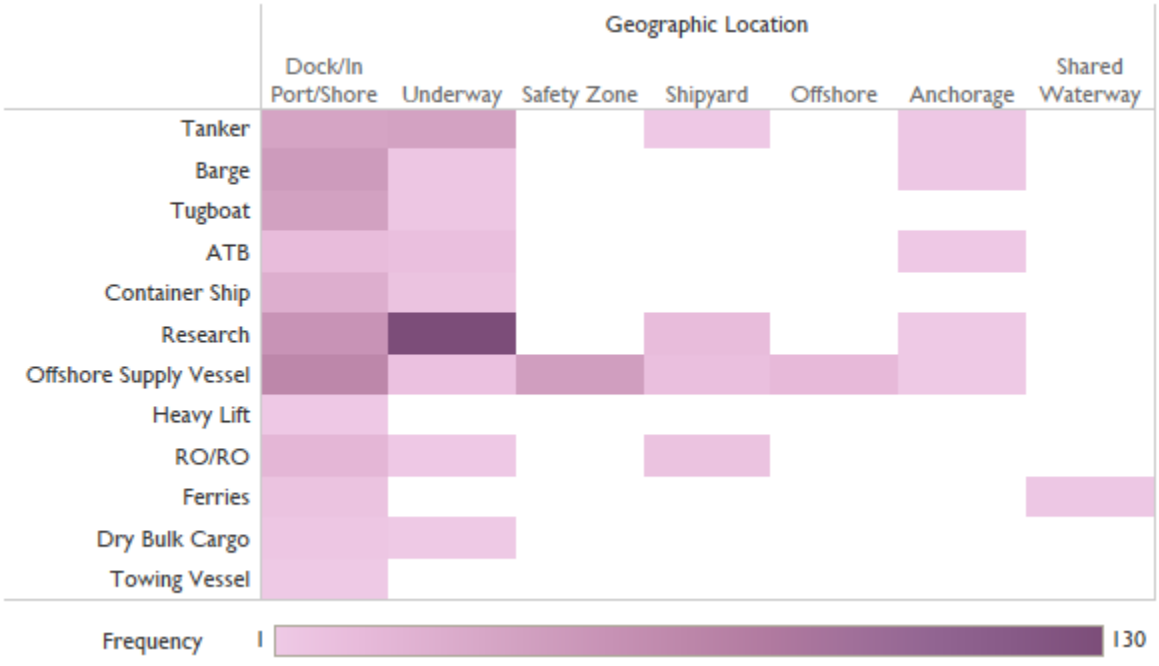


SOURCE: USDOT, Bureau of Transportation Statistics, SafeMTS Program.

Information on the type of vessel involved in a near-miss event is important as safety issues could extend across a vessel class. This information can also allow for comparisons of vessel type to other data elements such as near miss classification or geographic location, to identify potential trends or patterns. Figure 12 compares vessel type with geographic location for the subset of events in the pilot dataset with values for both of these data elements (11.8 percent of events). Ferries uniquely experienced events in shared waterways (also known as restricted waterways), and offshore supply vessels uniquely experienced them in a safety zone. Tankers and research vessels experienced more near misses while underway, relative to other vessel types; however, this observation is based on a small number of events, and more records with geographic location would be needed to confirm a trend.

While events in a shipyard were infrequent in the pilot dataset, risks while a vessel is in a shipyard are elevated due to the high level of work and activity going on, the unfamiliarity of the shipyard workers with the vessel, and the normally reduced crew size on the vessel during the shipyard period. Some companies keep a skeleton crew onboard to oversee shipyard overhaul and repair activities, and some do not.

Figure 12: Where Vessels Experienced Incidents (n=614)



SOURCE: USDOT, Bureau of Transportation Statistics, SafeMTS Program.

While most events had a near miss classification of equipment failure/damage or injury/illness, this differed across specific vessel types. After normalizing by near miss classification, shown in Figure 13, it becomes apparent that offshore supply vessels reported more unsafe condition events relative to other vessel types, and articulated tug barges (ATB) experienced more vessel-related events such as potential steering/propulsion loss, as well as potential flood events. Research vessels show a higher percentage of other injury/illness classifications, which could be a result of using more detailed injury selections such as caught in/under/between or fall to a different level, rather than capturing them under the catchall injury/illness category. Many of these differences are likely due to inconsistent application of near miss classification definitions across companies, and represent an opportunity for improved harmonization, discussed further in section 4.

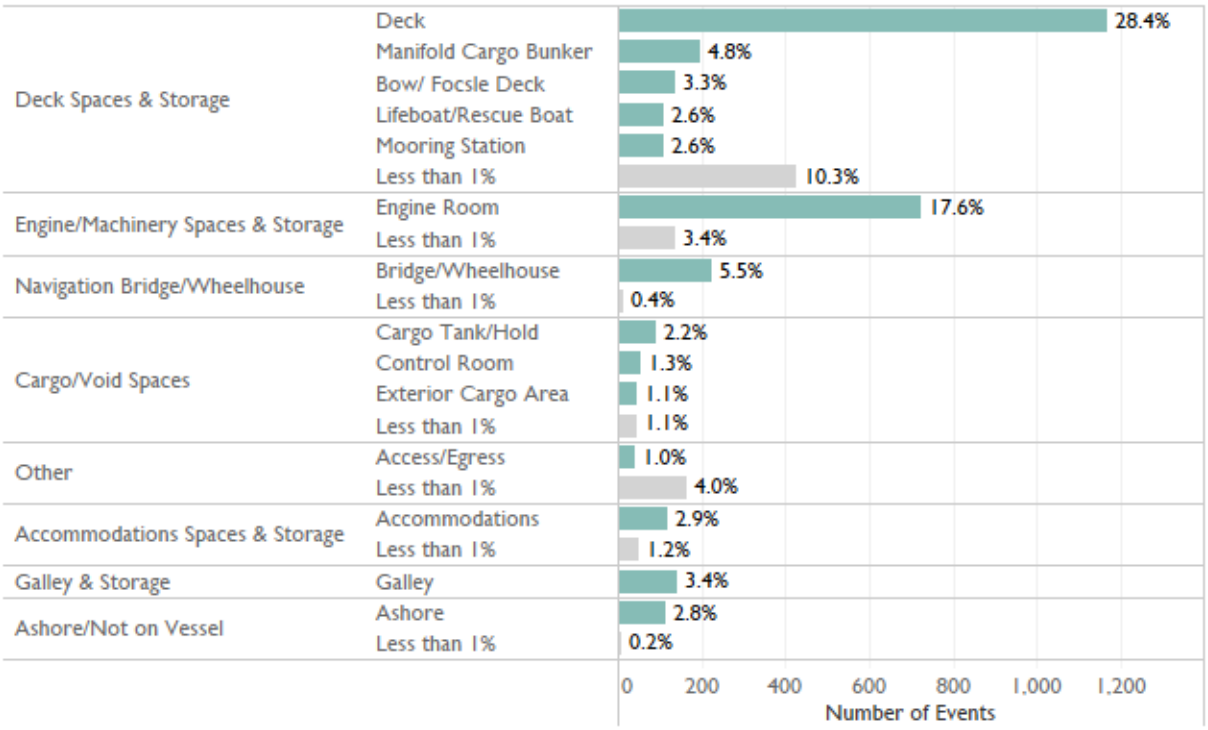
Figure 13: Near Miss Classification Across Vessel Types (n=4,019)

NOTE: Percent is calculated from the total events for each near miss classification (i.e., each box). "Other Inj/Ill Class." includes caught in/under/between, fall to a different level, hazardous atmosphere, lockout/tagout, and struck by. "Other Vessel-Related" includes DP (dynamic positioning) undesired event, loss of anchor, loss of tow, and power loss. "Other Classifications" includes dropped object, lifeboat release, and events with multiple selections.
SOURCE: USDOT, Bureau of Transportation Statistics, SafeMTS Program.

3.5 Operations and Activity

Where an incident occurs on the vessel can shed light on hazards or obstacles, both physical and otherwise, that may be present in those areas. Near-miss events associated with a particular area could indicate a high-traffic zone where most operations are ongoing, or an area associated with particular hazards such as a higher risk of falling objects. As shown in Figure 14, most events occurred around deck spaces (52.0 percent of events with information on location on vessel), followed by engine/machinery spaces (21.0 percent), both generally higher-traffic areas.

Figure 14: Location on Vessel (n=4,120)

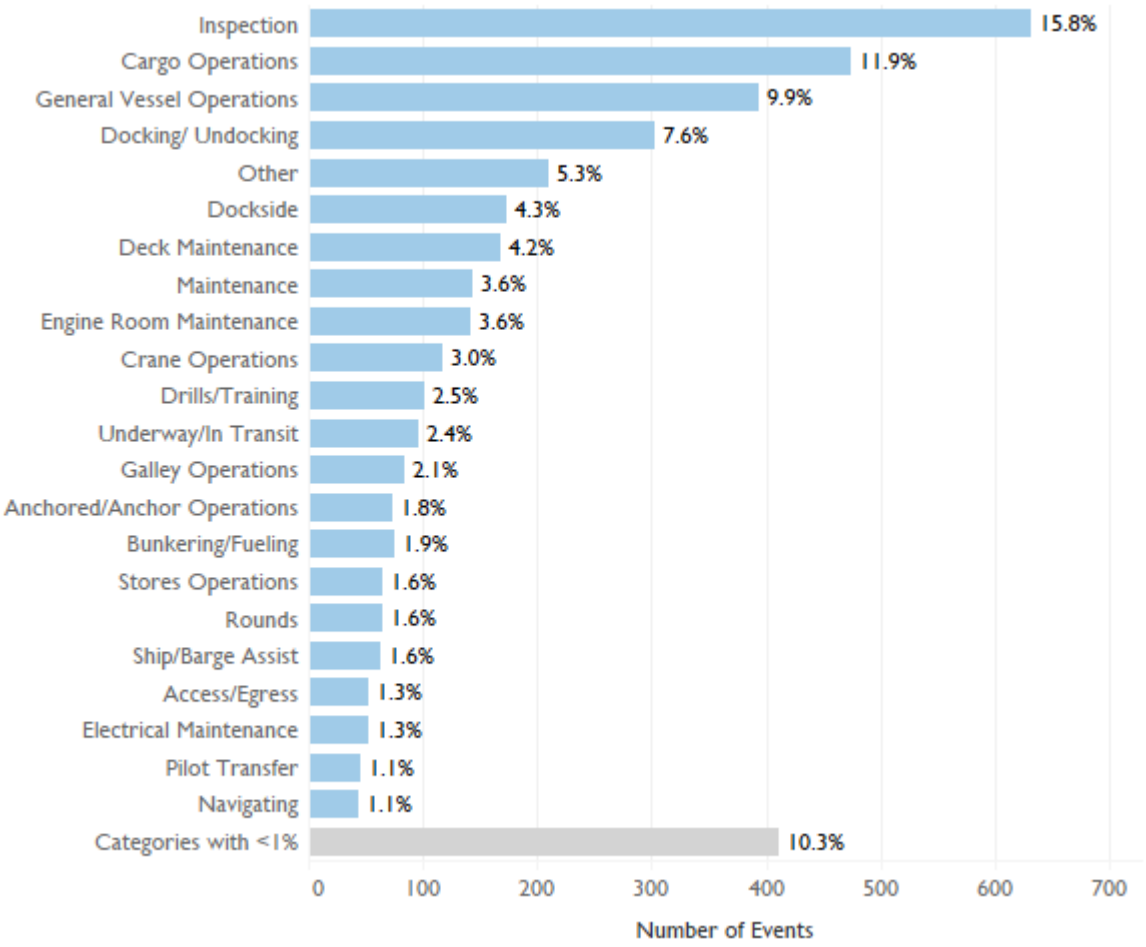


SOURCE: USDOT, Bureau of Transportation Statistics, SafeMTS Program.

Information on the operations at the time of an event is necessary for understanding where current risks exist and where improvements can be made. For most near misses, the ongoing operation or activity was inspection (15.8 percent of events with information on operation/ activity), cargo operations (11.9 percent), or general vessel operations (9.9 percent) as shown in Figure 15.

Across all companies, near-miss events were most often identified during rounds and programmed or routine equipment inspections. For one company, several events noted a higher potential consequence if individuals had succumbed to routine, highlighting the importance of staying alert to conditions—sounds, smells, temperatures, etc.—while performing otherwise routine tasks. Several equipment failures were due to faulty workmanship or improper materials used by outside vendors and shipyards. Some of those events noted issues that could have been found earlier when the work was initially accomplished, through inspection of work by non-crew members for adherence to specifications and proper system operation. Some events also noted crew members speaking up about potential issues they identified during routine operations, such as rigging the pilot ladder or stowing the ship's crane, helping to avoid potentially serious incidents.

Figure 15: Operations/Activity Ongoing (n=3,984)

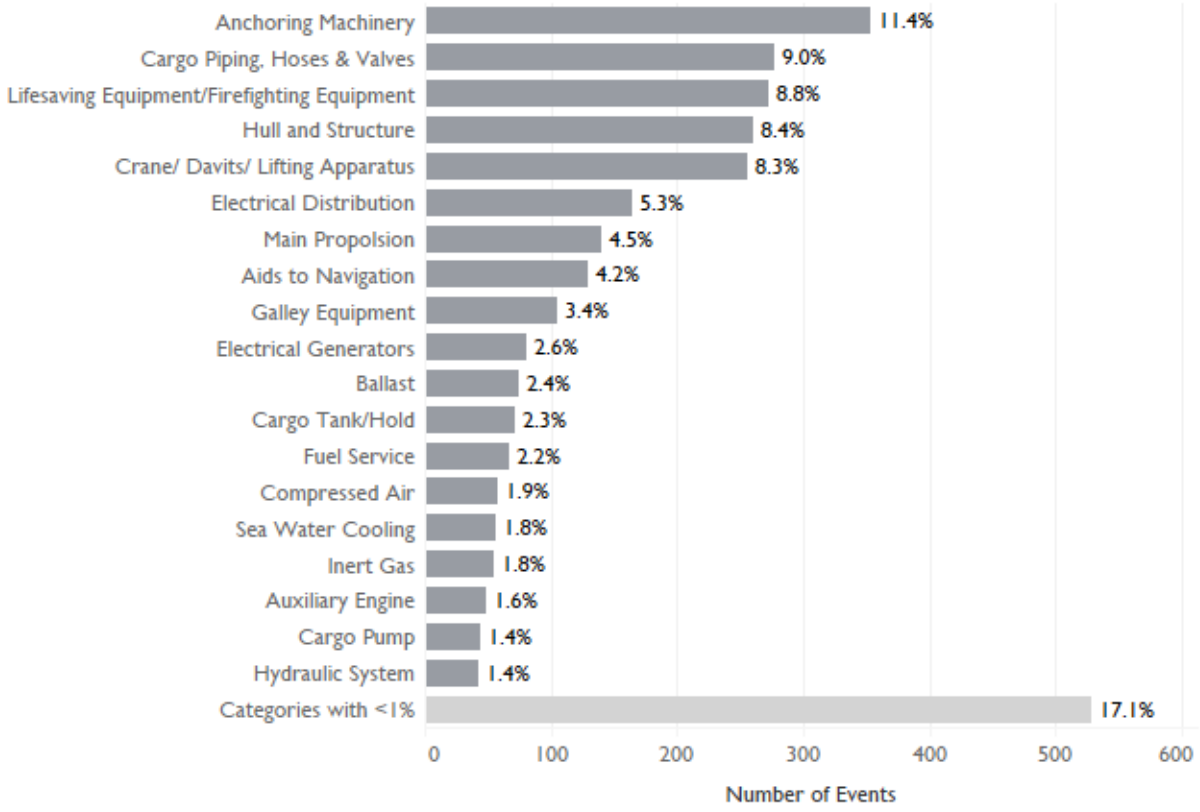


SOURCE: USDOT, Bureau of Transportation Statistics, SafeMTS Program.

For another company, most equipment damage/failure events occurred during normal operational activities. In a subset of these cases, the equipment was functioning but became overloaded during heavy weather or incorrect operation of the vessel (e.g., fender damage). One high potential event was discovered after an alarm signal of pending equipment failure.

As shown in Figure 16, the most frequent systems or equipment involved in near-miss events were anchoring machinery (11.4 percent of events with information on system/equipment); cargo piping, hoses, and valves (9.0 percent); lifesaving/firefighting equipment (8.8 percent); hull and structure (8.4 percent); and crane/davits/lifting apparatus (8.3 percent). These frequencies are likely a direct reflection of the operation going on at the time of the event and the system or equipment most often used during that operation. For example, when both the operation and system or equipment were reported (3,018 cases), most near-miss incidents occurring during crane operations involved cranes or lifting equipment, and near-misses during remotely operated vehicle (ROV) operations most often involved research equipment.

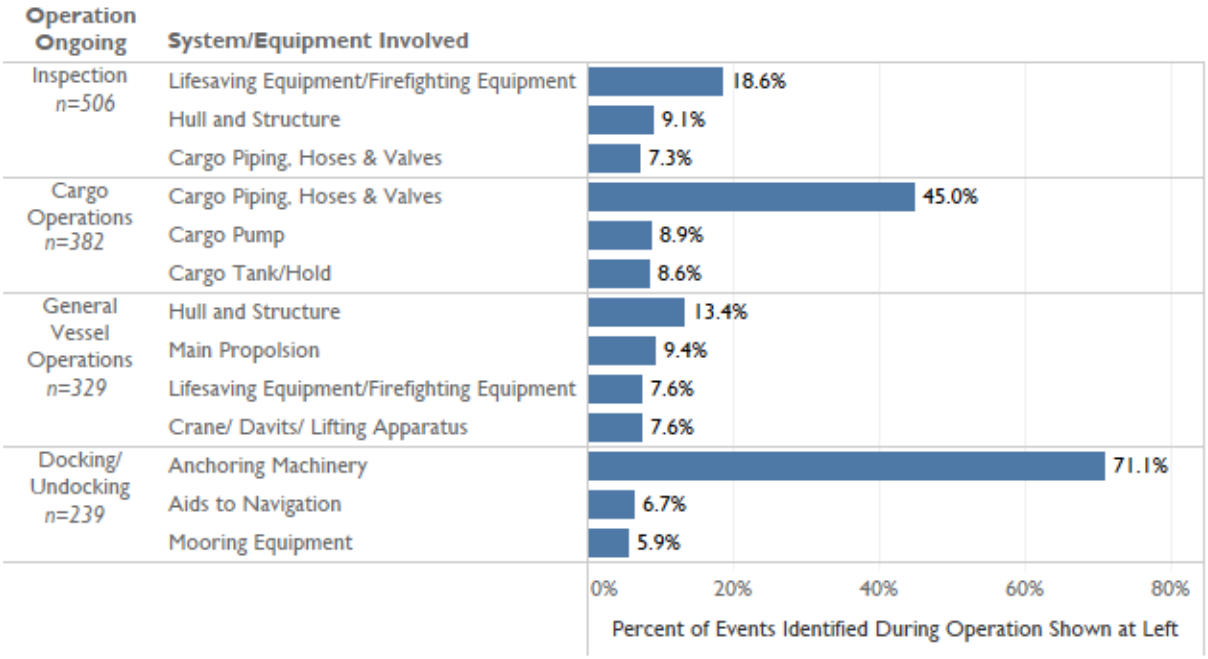
Figure 16: System/Equipment Involved (n=3,087)



SOURCE: USDOT, Bureau of Transportation Statistics, SafeMTS Program.

For more than 50 of the different types of systems or equipment involved, the near-miss event was identified during inspections. The most frequently reported equipment involved when a near-miss event was identified during inspections was lifesaving/firefighting equipment (18.6 percent of 506 events identified during inspections with information on equipment involved) (Figure 17).

Figure 17: Top Three Types of Equipment Involved, by Operation/Activity Ongoing

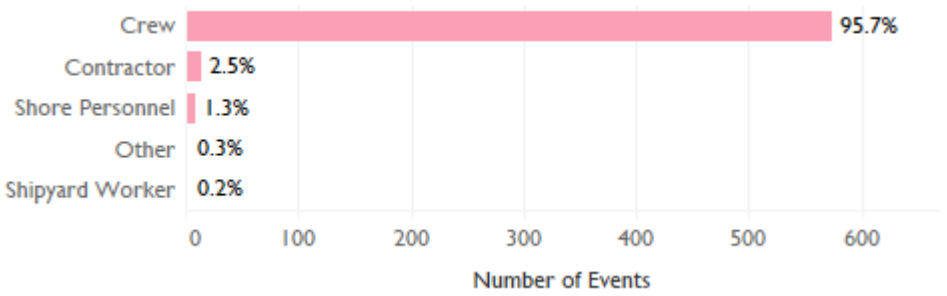


NOTE: Percent is calculated from the total events with the specified operation/activity ongoing that also had information on the system/equipment involved (shown as "n=" at left).
SOURCE: USDOT, Bureau of Transportation Statistics, SafeMTS Program.

(continues on next page)

The type of personnel (crew, contractor, etc.) was populated for only about 8.3 percent of events, with nearly all events involving the vessel crew (see Figure 18). Near-miss events involving non-crew personnel may be more likely when others are onboard or on location, such as during shipyard operations or passenger vessel operations. The pilot dataset included only a small number of events involving a passenger vessel.

Figure 18: Personnel Type (n=599)



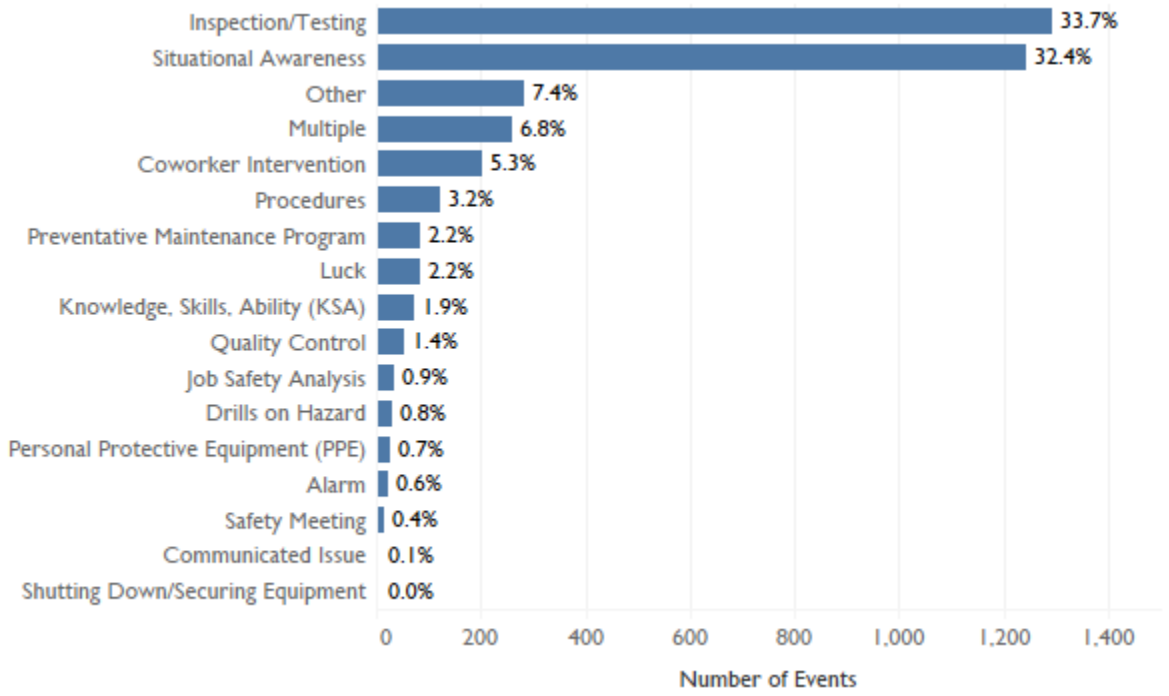
SOURCE: USDOT, Bureau of Transportation Statistics, SafeMTS Program.

3.6 Information on Causes and Follow-up/Preventive Actions

Information about factors preventing a worse incident can lead to identification and better understanding of successful barriers to more serious incidents. A preventive factor was reported in just over half of all cases in the pilot dataset (see Figure 19). The most common preventive factors were inspection/testing (reported for 33.7 percent of events with information on preventive factor) and situational awareness (12.7 percent), again showing that inspections are important opportunities to identify near-miss events.

Luck (or "being lucky") was commonly cited as a preventive factor for dropped object events, which could indicate a lack of any structured preventive measures. These measures, such as following proper procedures, using proper personal protective equipment (PPE), or being situationally aware, can counteract the human bias towards optimism and perceived control over the hazards and risks of an operation.

Figure 19: Factor Preventing Worse Incident (n=3,832)



SOURCE: USDOT, Bureau of Transportation Statistics, SafeMTS Program.

Though situational awareness was captured separately from knowledge, skills, and ability (KSA) in this dataset, a topic for further evaluation is whether the former is a subset of KSA. In reviewing the pilot dataset, events listing situational awareness as a preventive factor did not reveal how it could prevent worse incidents, as follow-up actions simply stated that situational awareness should continue to be practiced, as opposed to more actionable items such as conducting safety meetings or trainings. SafeMTS will consider an approach that weighs how follow-up actions such as training (resulting in knowledge, skills, and abilities) might better capture what leads to personnel exercising good situational awareness. Information on whether KSA could have prevented a worse event can help to identify those situations where training is most needed as a preventive measure.

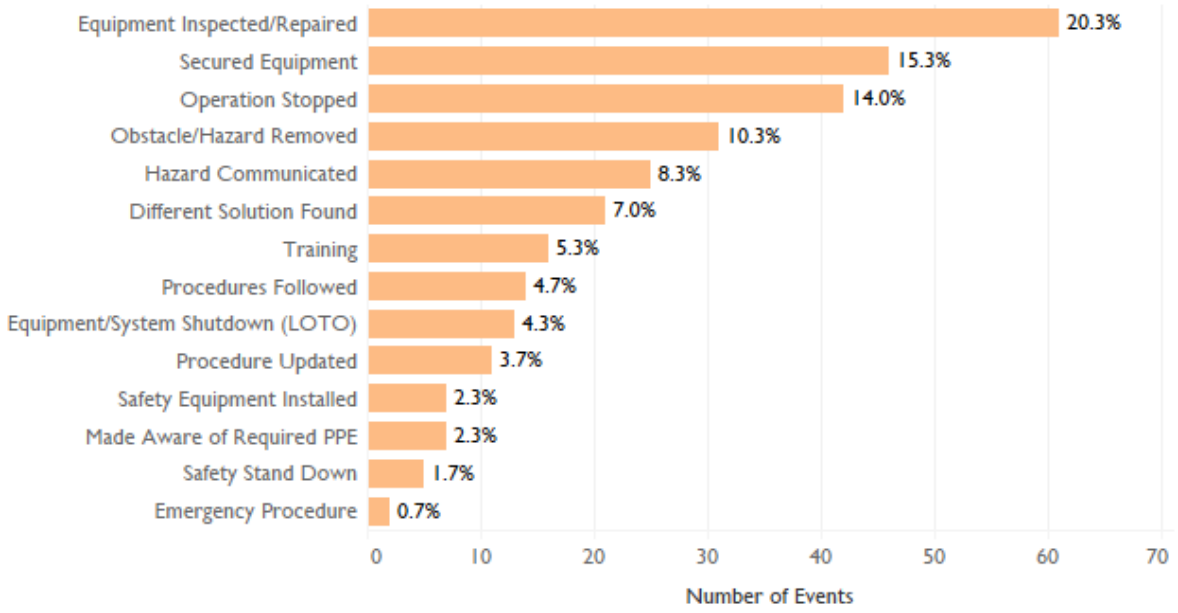
As an example, a crew member would not note the smell or sight of smoke as unusual without some prior basis for that assessment, meaning the person's recognition is due to, in this case, their knowledge and training about fires. If the individual had never been trained or taught what a fire was, what it could do, or how to recognize signs of one, the smell or sight of smoke

would not have elicited a response. Some specific cases from the pilot dataset are summarized below:

- Two ABs (able seaman) did not recognize air leaking from their pneumatic tool, but the Assistant Engineer walking by, as a result of his prior knowledge and training, did recognize the problem and took steps to correct it before it became a major incident.
- An engineer's knowledge and training enabled him to realize that the slowing of the main engine, which he determined from the sound change, was a problem given what other equipment he had online.

Corrective actions were generally provided in free text form. For 301 events, corrective actions were captured as structured values, approximately one third of which were inspecting, repairing, or securing equipment (see Figure 20). This aligns with the higher frequency of equipment failure/damage relative to other near miss classifications. The SafeMTS data key distinguishes immediate corrective actions from systemic ones. Systemic corrective actions, along with causal factors and root cause, have among the highest potential learning value of any standalone data fields. A goal of SafeMTS as it matures will be to further engage with industry to evaluate and address any barriers companies may face in collecting this information.

Figure 20: Immediate Corrective Action (n=301)

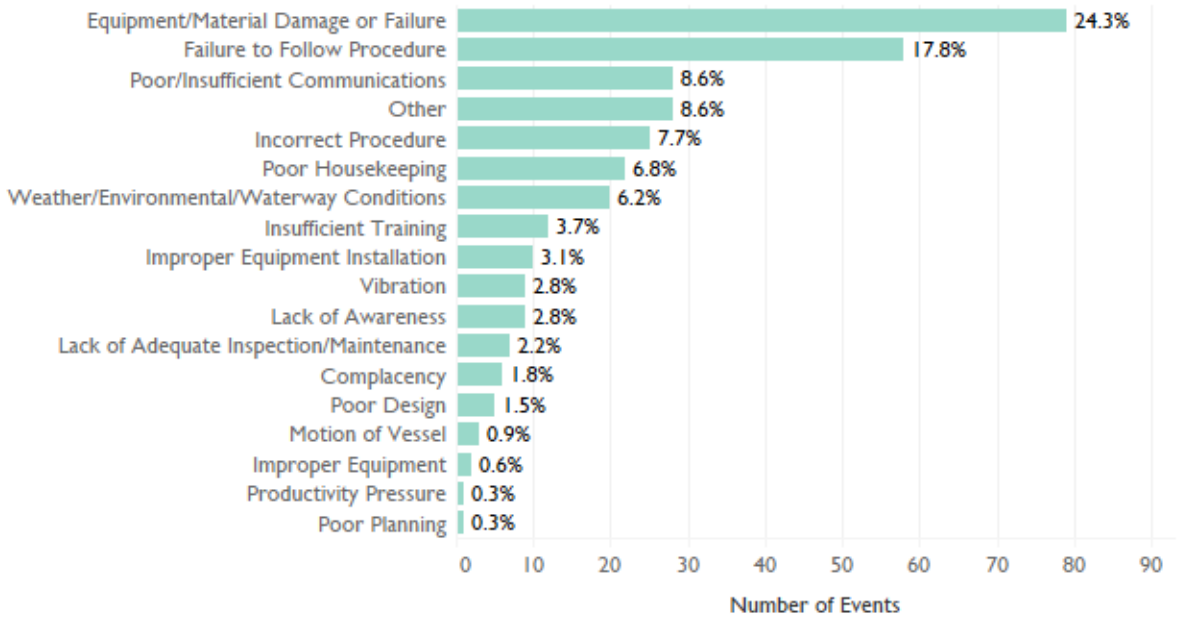


SOURCE: USDOT, Bureau of Transportation Statistics, SafeMTS Program.

Causal information was provided in a structured format or extracted for 325 events, shown in Figure 21. For these events, equipment/material damage and failure to follow procedure were the most commonly cited causal factors (24.3 and 17.8 percent of events, respectively, with information on causal factors).

Some cases of injury/illness involved misuse of ladders, captured as a failure to follow procedure. Typically, the person involved continued to use a too-small ladder for the last few steps in a job, rather than stopping work to get a bigger ladder. Poor communication was frequently cited as contributing to events involving disruption of operations, as either failure to inform others of an action affecting another on-going operation or failure to maintain open lines of communication between the ship and the terminal. Complacency was a causal factor in multiple cases of potential fire/explosion, such as stoves or other heat sources left on and unattended, or clothes dryer vents not being properly cleaned of accumulated lint.

Figure 21: Causal Factors (n=325)



SOURCE: USDOT, Bureau of Transportation Statistics, SafeMTS Program.

A root cause was listed or extracted for 75 events, eight of which were labeled as high potential severity. Overall, for these 75 cases, complacency and failure to follow procedure were the two most-cited root causes (representing 36.0 percent), yet nearly all had a follow-up

action of increased inspection, maintenance, or testing of equipment, or to remain vigilant during ongoing activities. A question for further review and analysis is examining follow-up actions against the listed causal factors for reported near-miss events.

While causal information has among the highest potential learning value of any near-miss event information, it is not currently captured by all companies, or it is only sometimes determined. A potential next step to improve the completeness and quality of causal information is to develop minimum standards for the collection of near-miss causal information. Establishing standard groupings of causal factor information, with potential dependency structures, could also lead to improved data quality and potential for learnings, discussed further in section 4 and the discussion accompanying Figure 22.

4 Data Challenges and Recommendations

A key aspect of the SafeMTS pilot was the acceptance of data in disparate formats, which was intended to both ease the reporting burden of participating companies and allow for comparison of near-miss data elements and formats across companies. Differences were observed in the data elements collected, the completeness of each element, and the definitions of common elements and values. These differences present two potential and related challenges for consideration and resolution as SafeMTS moves beyond the pilot phase: ensuring data can be properly aggregated across companies to allow for baselining and trend identification, and ensuring data is sufficiently complete and robust to generate learning value.

Regarding data aggregation, properly combining data across companies depends on whether common definitions are used and if data is captured in structured or unstructured format (i.e., drop-down selections versus free text). For the pilot dataset, values could sometimes be extracted from unstructured data through automated text mining and classification scripts, but more often required resource-intensive review by subject matter experts to populate missing values. Machine learning techniques present the potential for targeted classification of unstructured data; however, these models require significant amounts of data for good results, and data sparseness can also pose a challenge.

Regarding the learning value of the SafeMTS data, it is important that data fields with critical learning value are consistently reported, such as preventive factors, contributing factors, root cause, and systemic corrective actions. It appears from the data that, in at least some cases, differing standards are applied to determine when a near-miss event undergoes further investigation and determination of causal factors. Even when this information is collected, a company may face challenges compiling and retrieving it from their internal data systems if investigation information is stored in a separate database from the event information.

To address these challenges, the following recommendations are proposed for both the SafeMTS program and company-specific data programs.

1. **Apply a consistent scope across companies of near-miss events to be included in SafeMTS.** Differences between companies in the scope of events

captured in the pilot dataset suggest varying practices across vessels and fleets in determining when a near-miss event should be reported. The recommended scope for SafeMTS includes both near-miss events as well as lesser precursor safety events with learning value such as recognized hazards or undesired events. Additional guidance should be developed to clarify the distinction among these event types, as well as when an event with consequences should be considered a near-miss event. Participants are also encouraged to provide data related to near-miss and precursor events that occur while off-shift. An off-shift event can include an illness or injury that occurred off property but continued or worsened while on duty.

2. **Standardize definitions and values for specific data elements.** The SafeMTS data key can be leveraged to promote harmonization of the identified core data fields across industry. Harmonizing the definition of type of event (near-miss versus lesser precursor event) is particularly important to enable trend identification and valid comparisons when aggregating across companies. Also, companies should consider implementing data validation rules for structured data fields to prevent inconsistency and misspellings.

3. **Ensure all available information for an event is shared with SafeMTS.** Participants are encouraged to provide data for all the identified core data fields, including investigation information; however, this can be difficult in cases when a company's data resides in separate data systems. Companies are encouraged to identify where this information resides and develop a script to facilitate pulling the data in a consistent way for each SafeMTS data submission. Companies should avoid redacting information that could otherwise prove beneficial during the aggregation process (e.g., the record identifier) and using merged or hidden cells, given robust confidentiality protections under CIPSEA.

4. **Adhere to an established frequency for data submission to SafeMTS.** Following the pilot, participants will be expected to share data on a quarterly basis at minimum. As the process becomes more standardized, a goal of monthly submission frequency will be targeted to ensure timely results can be provided by BTS. For confidentiality and to prevent reidentification, it is important that BTS receives a

sufficient volume of data such that aggregated results cannot be associated with any individual participant's identity. If data is inconsistently submitted, it can prevent or delay aggregated data from being shared back to participants.

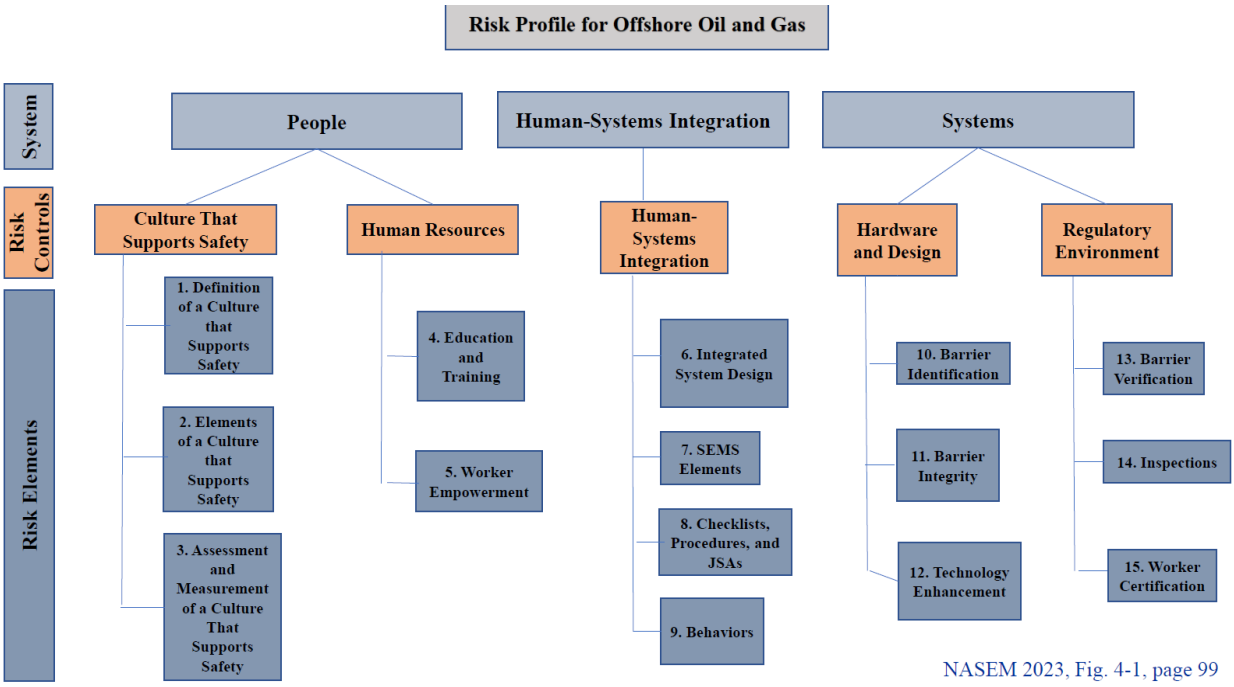
5. **Continue to develop improvements to the SafeMTS data key.** The data key is expected to evolve and improve through continued engagement with stakeholders and as additional companies join the SafeMTS program and the database grows. Examples of areas identified for further development include the following:

    a. Given the typical additional preparation, hazard identification, and risk mitigation associated with special permitted activities (e.g., lockout/tagout, hot work), consider the benefits of capturing these data as a separate data field.

    b. SafeMTS will seek further input and guidance from stakeholders on data elements and structures for collecting, reporting, and analyzing causal factors, root cause(s), and human element considerations. For example, recent research by the National Academies identified three categories of controls at play in managing risk in the offshore oil and gas industry: people, human-systems integration, and physical systems (seen in Figure 22).[8] SafeMTS could consider these categories for potential grouping of causal factor data, to improve capability of identifying actionable safety issues and trends across companies.

[8] National Academies of Sciences, Engineering, and Medicine. 2023. *Advancing Understanding of Offshore Oil and Gas Systemic Risk in the U.S. Gulf of Mexico: Current State and Safety Reforms Since the Macondo Well Deepwater Horizon Blowout*. Washington, DC: The National Academies Press. https://doi.org/10.17226/26873.

Figure 22: Risk Management Framework, from National Academies 2023 Report



SOURCE: Figure 4-1, p. 99, in National Academies of Sciences, Engineering, and Medicine. 2023. *Advancing Understanding of Offshore Oil and Gas Systemic Risk in the U.S. Gulf of Mexico: Current State and Safety Reforms Since the Macondo Well Deepwater Horizon Blowout*. Washington, DC: The National Academies Press. https://doi.org/10.17226/26873.

5 Proposed Approach for Broader SafeMTS Implementation

This section describes the next steps after the pilot study and plans for how the full SafeMTS program would function. The proposed approach considers information gathered during the pilot phase, input from pilot participants and other industry stakeholders, and lessons learned from development and operation of other similar systems established to promote transportation or energy safety.

5.1 SafeMTS Governance and Overarching Operation

A proposed governance and high-level operational structure for the program is informed by three foundational requirements for a voluntary maritime near-miss reporting program: robust protections for industry-provided data, public sector involvement to support development and operations, and high levels of industry engagement.

- **Roles of MARAD and BTS:** MARAD will serve as the program sponsor and will establish and monitor program goals and objectives in coordination with industry and BTS. BTS will serve as administrator for development, maintenance, and operations of the data system, data analysis, dissemination of data products, and ensuring the confidentiality of submitted data under CIPSEA.

- **Roles of Industry Participants and Other Stakeholders:** Participants will contribute data, provide input on system requirements and data products, and share feedback on potential program improvements. MARAD and BTS will solicit input and engagement with other industry organizations and groups in addition to participants.

- **General Requirements to Participate:** Any company with vessel operations may join SafeMTS. Participating companies will enter into a memorandum of agreement (MOA) with BTS describing data protections and expectations for data sharing. A similar MOA from the SafeOCS program is provided in Appendix C, as an example of what the SafeMTS MOA will cover. Participants may also approve inclusion of their data in additional dashboards such as the public dashboard or sector-specific dashboards developed for industry associations.

- **High Level Operational Process:** The major steps of the data collection, analysis, and dissemination process for SafeMTS are summarized below and in Figure 23.

    - Data Ingestion: Data shared by participants via the SafeMTS secure portal will be ingested into the SafeMTS database. The ingestion process will be automated to the extent practicable through defined mappings between the company data file and the SafeMTS data key. Data quality assessments will be conducted both initially and on an ongoing basis.

    - Initial SME Data Review for Harmonization: As needed, SMEs will review ingested data to improve consistency with the data key and allow for more useful analytics.

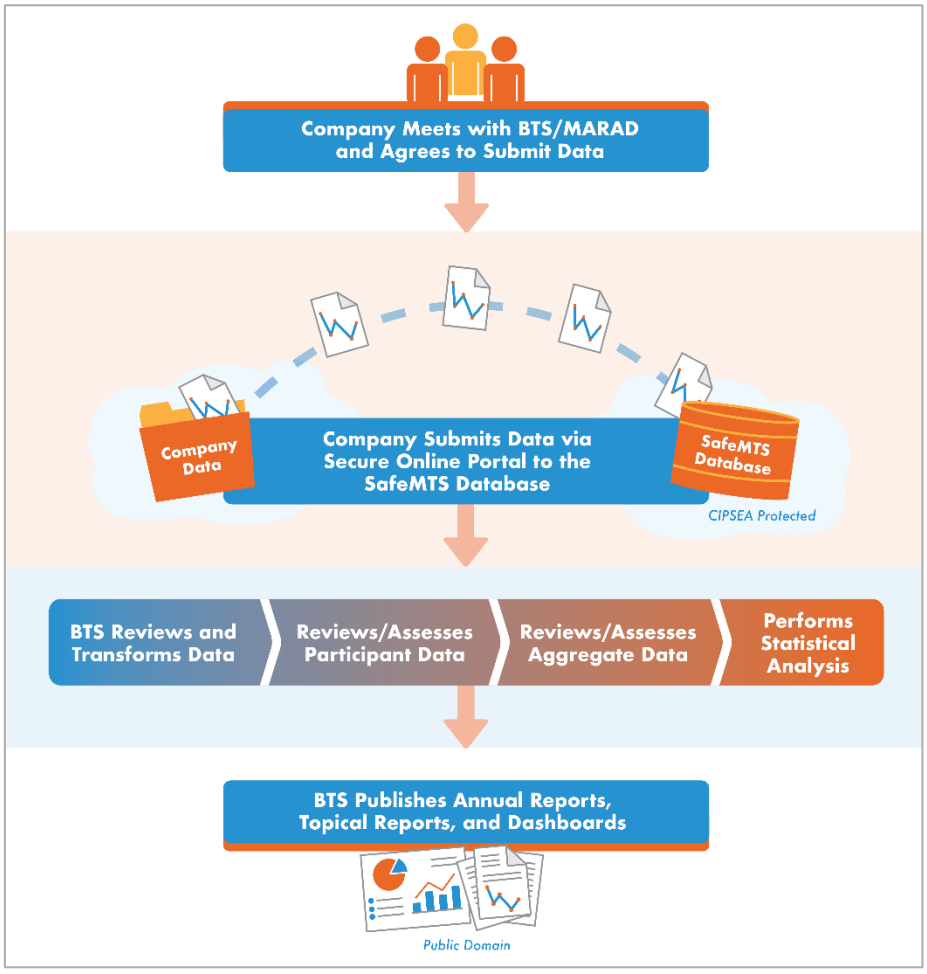
    - Data Analytics: The SafeMTS team will aggregate and analyze the data for patterns and trends, leveraging statistical and analytical resources available in the BTS secure server environment.

    - SME Review/Assessment: SMEs will review the aggregated data results and evaluate the data for safety and human element/factors insights.

    - Products and Tools: Dashboards will be used to share results with participants. Publications may also be developed, such as periodic or ad hoc reports, safety alerts or bulletins, and other safety-related products of interest to stakeholders. Additional detail on products and tools is provided in section 5.2.

    - Disclosure Review: In accordance with legal requirements and BTS confidentiality policy, BTS will review any information products prior to release to ensure adherence to CIPSEA.

Figure 23: Data Process Overview



SOURCE: USDOT, Bureau of Transportation Statistics, SafeMTS Program.

5.2 SafeMTS Product Portfolio

The SafeMTS product portfolio includes the suite of products and services that will be developed and maintained under the program. Some of these were initially developed during the pilot and others are proposed for future development depending on resource availability.

- **SafeMTS Database:** The database is structured to allow flexibility as core data fields are adjusted or added and drop-down choices evolve. Analytical tables will supplement the base transaction tables to support requirements for analysis.

- **SafeMTS Website and Secure Data Portal:** A secure data portal, allowing

participants to securely log in and share data files, was launched for SafeMTS during the pilot phase. The planned SafeMTS website will expand on the secure data portal, giving additional information about the program without requiring log in. Public products, such as the data key, will be posted to the website.

- **SafeMTS Dashboards:** Three types of dashboards may be implemented.
    - General industry safety performance dashboard (public access): This dashboard will provide top-level information resulting from analysis of SafeMTS data. No identifying information will be shown.
    - Company safety analytics dashboard (protected, access limited to individual participants): This dashboard allows participating companies to make safety comparisons with related industry segments, as well as various operational components within their organization.
    - Association safety analytics dashboard (protected, access limited to designated association personnel): This dashboard allows an industry association access to information on the subset of data attributed to their members who are participants in SafeMTS, with appropriate permissions from the data providers.
- **SafeMTS Publications:** Periodic and ad hoc reports may be developed to share information about specific safety issues or report on program status. In addition, SafeMTS may develop notices on identified safety issues when a concern arises from data review. These notices would be published on the SafeMTS website and shared with appropriate industry organizations and stakeholders for appropriate action.
- **SafeMTS Data Key:** The data key is intended to identify the set of variables and values necessary for the collection of meaningful information about a near-miss event. An initial SafeMTS data key, provided in Appendix A, was developed for the pilot phase. The key will be maintained and updated periodically, in coordination with industry and other stakeholders, as improvements are identified.
- **SafeMTS Data Dictionary:** The data dictionary will provide definitions for the

SafeMTS core data fields and values to promote consistency across participating companies.

- **Guidance for Contributed Data Sets:** This document will provide information to stakeholders on the recommended structure, format, and content of contributed data sets. It will also describe the process for secure transmission of data to BTS.

- **Narrative Guidance**: In collaboration with stakeholders, a guidance document will be developed to promote the collection of actionable event narratives for near-miss events. A draft guidance document for event descriptions is provided in Appendix B. Additional guidance documents for the collection of other data fields or values, such as human factors information, may also be developed.

- **Data Entry Form**: A SafeMTS data entry form will be developed to align with the data key, as a resource for companies and organizations in the collection of near-miss data or administration of their safety management system (SMS). As SafeMTS matures, it is envisioned that electronic forms, application programming interfaces (APIs), or other tools will be developed to support data collection and reduce participant reporting burden. SafeMTS will also evaluate common software used by maritime companies in managing their SMSs to promote harmonization of data fields.

- **Data Collection App**: In collaboration with SafeMTS participants and stakeholders, an application may be developed to support organizations in the collection and reporting of near-miss data.

5.3 NEXT STEPS

As the number of SafeMTS participating companies grows, more data can be captured, analyzed for trends, and reported out for industry action, with the goal of preventing more serious events. BTS and MARAD will define a phased growth plan, to allow the program to grow at a rate matching available resource levels over the next two years, with accompanying goals and performance measures. MARAD will conduct information sessions, similar to those previously held with industry organizations such as SOCP, AWO, PVA, and others, and conduct outreach

activities to recruit new participants in accordance with the growth plan. BTS will also host onboarding meetings for new participants to discuss the MOA and the content, format, and schedule of data submissions.

The phased growth plan will identify the subset of core data fields that will be captured in the first stage of the full program. These are data fields that can be provided directly or derived from available information from most potential participants, based on learnings from the pilot, such as incident type/category, near miss classification, vessel type, location on vessel, operations/activity ongoing, system/equipment involved, factor preventing worse incident, and potential consequence. Stage two of implementation will include additional data fields that require more discussion and evaluation with stakeholders, such as geographic location. As the program matures, BTS and MARAD will work with stakeholders to improve data elements related to causal factors and systemic corrective actions, including evaluating and addressing any barriers companies may face in collecting this information.

As additional data is collected and aggregated results become available, BTS and MARAD will work with stakeholders to evaluate ways the data can inform potential safety improvements, and BTS will assist in interpreting SafeMTS statistical results. The data key and other SafeMTS guidance products can be applied to update the ASTM near-miss reporting standard. BTS and MARAD will continue to engage with industry stakeholders on data harmonization efforts (for example, improving the capture of causal factor information) and ensure SafeMTS provides value to stakeholders.

Appendix A: SafeMTS Pilot Phase Data Key

#	Data Field Description	Data Format	Acceptable Value	Comments
1	SafeMTS Event ID	ID Code		SafeMTS-assigned
2	Company Name	Categorical		
3	Company Event ID	ID Code		Unique ID assigned by company
4	Event Date	Date	MM/DD/YYYY	
5	Time of Event	Time	HH:MM	
6	Event Description	Free Text		
7	Incident Type/Category	Categorical	- Near Miss (Unsafe Act) - Hazard Recognition (Unsafe Condition) - Undesired Event (Negative Business Impact) - Other - Not Applicable	Single Select
8	Near Miss Classification	Categorical	- Caught In, Under, Between - Collision/Allision - Contamination - Damage - Cargo - Damage - Equipment - Damage - Structural - Disruption of Ops - DP Undesired Event - Dropped Object - Electrocution - Equipment Failure - Fire/Explosion - Flooding - Grounding - Hazardous Atmosphere - Illness/Injury - Lifeboat/Rescue Boat Release - Line Handling - Loss of Anchor - Loss of Tow - LOTO (Lockout/Tagout) - Missing Guards - Missing or Damaged PPE - Other Lifesaving Equipment Malfunction - Pollution/Spill - Power Loss - Sensor Failure - Slip/Trip/Fall (No Injury) - Smoke/Smolder - Struck By - Other - Not Applicable	Single Select
9	Geographic Location	Categorical		Single Select
10	Vessel Name (1) & (2)	Free Text		Populate Vessel Name (2) if the event involved

				two vessels.
11	Vessel Type (1) & (2)	Categorical	- ATB - Barge - Barge - CB - Barge - LASH - Break Bulk/General Cargo - Con/RO - Container Ship - Dry Bulk Cargo - Heavy Lift - Large passenger - MODU - Offshore Supply - Offshore Supply/Anchor Handler - Passenger - Cruise Ship - Passenger - Ferries - Pilot Boat - Research - RO/RO - School Ship - Small passenger - Survey - Tanker - Chemical - Tanker - LNG/LPG - Tanker - Oil - Towing vessel/Ocean-going tug - Tug & Barge (Connected) - Tug Boat (Harbor/Inland) - Other - Not Applicable	Populate Vessel Type (2) if the event involved two vessels.
12	Business Segment	Categorical	- Blue Water - Brown Water - Container - Dry Cargo - Harbor Services - International - Jones Act - Ocean Carrier - Passenger - Tanker - Other - Not Applicable	Single Select
13	Location on Vessel	Categorical	- Accommodations Spaces & Storage - Ashore/Not on Vessel - Cargo/Void Spaces - Deck Spaces & Storage - Engine/Machinery Spaces & Storage - Galley & Storage - Navigation Bridge/Wheelhouse - Other - Not Applicable	Single Select
14	Location on Vessel - Detail	Categorical	- Accommodations/State Room - Control Room - Doorway - Head	Single Select. Dependency from "Location on Vessel"

			- Laundry - Lazarette - Lounge - Mess Hall - Passageway - Stairs/Ladder - Storage Space - Ashore/Not on Vessel - On Dock - Overboard - Ballast tank - Cargo Tank/Hold - Control Room - Duct Keel - Exterior Cargo Area - Fuel Tank - Hold - Void Space - Aloft - ATB Notch - Ballast Water treatment house - Battery Locker - Bow/Focsle Deck - Bunker Station - Catwalk - Control Room - Damage Control Locker - Deck - Doorway - Forepeak - Gangway - Hull - Lifeboat/Rescue Boat - Manifold Cargo Bunker - Mooring Dolphin - Mooring Station - Muster Station - Outboards/Over the side - Paint Locker - Passageway - Pilot Ladder - Ramp/RoRo - Ship Crane - Stairs/Ladder - Stern - Storage Space - Towing Winch - Tunnel - Walkway - Workshop - AMS (auxiliary machinery space) - Battery Locker - Bow/Stern Thruster Room - Bunker Station - Co2 Room	

			- Control Room - Doorway - Electric Shop - Emergency Generator Room - Engine Space - Foam Room - Inert Gas Room - Machine Shop - Pump Room - Purifier Room - Stairs/Ladder - Storage Space - Tunnel - Workshop - Galley - Stairs/Ladder - Storage Space - Battery Locker - Bridge/Wheelhouse - Doorway - Intercon Room - Storage Space - Other - Not Applicable	
15	Operations/Activity Ongoing	Categorical	- Access/Egress - Administrative - Anchored - Assisting - ATB Assist/Escort - Audit - Backloading Equipment - Ballasting/De-Ballasting - Bunkering/Fueling - Cargo Operations - Carrying Supplies - Change Battery - Cleaning - Confined Space Operations - Crane Operations - Deck Machinery Maintenance - Deck Maintenance - Deck Operations - Deicing - Diving Operations - Docking/Undocking - DP Operations - Drills/Training - Drydock/Shipyard Operations - Electrical Maintenance - Embarking/Disembarking - Engine Room Maintenance - Escort Of Navy Vessel - Filling Potable Water Tanks - Galley Operations - Garbage Management	Single Select

			- General Vessel Operations - Helicopter Operations - Helideck Inspection - Hose Transfer - Hot Work - Idle/standing by - In Port - Inspection - Internal Fuel Transfer - Laundry - Lifeboat/Rescue Boat Activities - Liferaft Activities - Line Tending - Loading Deck Cargo - Loading Potable Water - Loading Stores/Supplies - Lock Operations - Lube Oil Transfer - Maintenance - Make/Break Tow - Military Operations - Navigating - Off Watch - Over The Side - Painting/Chemical Use - Personal Care - Personnel Transfer - Pilot Transfer - Power Tool Use - Pre-Departure Checks - Receiving Risers From The Rig - Rigging/Stowing Gangway - Rigging/Stowing Pilot Ladder - Rounds - ROV Operations - Running Lines (Power, Gas, Communications) - Safety System Inspection - Ship/Barge Assist - Shore Power Operations - Slops Transfer - Stores Operations - Subsea Operations - Tank Vessel Escort - Tank/Hold Cleaning - Testing Safety Equipment - Towing - Underway/In Transit - Walking - Waste Handling - Working Aloft/At Heights - Other - Not Applicable	
16	System/Equipment Involved	Categorical	- Accommodation/Habitability - Anchoring Machinery	Single Select

			- Aids to Navigation (ATON) - Auxiliary Engine - Ballast - Bilge - Boiler (Main or Auxiliary) - Bow/Stern Thruster - Cargo being carried - Cargo Gear - Cargo Piping, Hoses & Valves - Cargo Pump - Cargo Tank/Hold - Cleaning Fluids/Materials - Clothes Washer/Dryer - Comminuter-Food Grinder - Communication Equipment - Compressed Air - Cranes/Davits/Lifting apparatus - Deck Gear - Deck Plating - Diving Equipment - Dock Equipment - Documentation - Door/Hatch - Electrical devices/appliances - Electrical Distribution - Electrical Generators - Fire Fighting - Forklift - Freezer/Chill Box/Storeroom - Fresh Water Generator - Fuel Purification - Fuel Service - Fuel Tank - Galley Equipment - Gangway - Garbage - GMDSS - Hatch - Heat Exchanger - Helm - Hold - Hospital - Hull And Structure - HVAC - Hydraulic System - Incinerator - Inert Gas - Intercon Coupler - Ladder/Stairs - Landing Chair - Lifeboat/Rescue Boat - Lighting/Electrical Fixture - Lube Oil - Lube Oil Purification - Main Propulsion	

			- Main Reduction Gear - Mast/Rigging - Mooring Equipment - Navigation - Navigation Lights - Oily Water Separator (OWS) - Other Lifesaving Equipment - Other Vessel - Personal Protective Equipment (PPE) - Pilot Ladder - Potable/Distilled Water - Power Tools/Tools - Propeller & Shafting - Railing - Ramp - Reefer Container - Refrigeration - Research Equipment - ROV - Sea Water Cooling - Sewage - Slop Tank - Sludge - Steam - Steering - Stern Ramp - Stowage System (Software) - Stripping And Transfer - Test equipment - Thermal Oil - Towing Equipment - Vapor Recovery - Vender/Customer equipment - Ventilation - Void Space - Welding/Hot work Equipment - Other - Not Applicable	
17	Observing Personnel Type	Categorical	- Crew - Contractor (Supernumerary) - Passenger - Shore Personnel - Shipyard Worker - Other - Not Applicable - Not Reported	Single Select
18	Factor Preventing Worse Incident	Categorical	- Alarm - COI inspection finding - Communicated Issue - Coworker Intervention - Drills on Hazard - Equipment Design - Inspection/Testing - Job Safety Analysis (JSA)	Multi-select

			- Knowledge, Skills, Ability (KSA) - Luck - Personal Protective Equipment (PPE) - Preventative Maintenance Program - Procedures - Quality Control - Risk Mitigation Measure(s) that prevented further consequence escalation (swiss cheese model) - Rounds - Safety Meeting - Securing Loose Objects - Shutting down/securing equipment - Stop Work Authority - Other - Not Applicable	
19	Action Taken - Narrative	Free Text		
20	Immediate Corrective Action	Categorical	- Clean-up - Coworker Assistance - Different Solution Found - Emergency Procedure - Equipment Inspected - Equipment/System Shutdown (LOTO) - Hazard Communicated - Made Aware of Proper Procedure - Made Aware of Required PPE - Obstacle/Hazard Removed - Operation Stopped - Procedures Followed - Safety Equipment Installed - Safety Stand Down - Secured Lose Gear/Equipment - Shift Ballast - Other - Not Applicable	Multi-select
21	Systemic Corrective Action	Categorical	- Develop & install proper labeling - Different solution found - Discontinue equipment use or operation - Equipment Properly Labeled - Equipment/System repaired/replaced/modified - Improve Equipment maintenance/inspection program - Improve organization communication - Made Aware of Proper Procedure - Made Aware of Required PPE - Modify/Develop Procedure (JSA) - New PPE provided - Obstacle/Hazard Removed - Order spare parts/technical	Multi-select

			assistance required - Review Procedures/Provide Training - Safety Equipment Installed - Safety Meeting - None - Other - Not Applicable - Not Reported	
22	Potential Consequence	Categorical	- Activation Of Fire Suppression System - Client Cargo Damage/Contamination - Collision/Allision - Contact With Suspended Object - Container overboard - Contamination - Damage - Cargo - Damage - Equipment - Damage - Structural - Dropped Object - Economic/Reputational Damage - Electrical Hazard/Fire - Environmental Hazard (not spills) - Equipment Failure - Extra Work/Time/Cost/Delay - Fall - Fall Into Open Hole - Fall Overboard - Falling Object - Fatigue - Fire/Explosion - Grounding - Hatch Damage - Hull Damage - Injury - Other - Injury - Medical Treatment Case - Injury - Amputation - Injury - Asphyxia/Choking - Injury - Burn - Injury - Chemical/Radiation Exposure - Injury - Crushing - Injury - Cumulative Trauma - Injury - Disease - Injury - Drowning - Injury - Eye/Vision Impairment - Injury - Fatality - Injury - First Aid - Injury - Hearing - Injury - Heart Attack/Condition - Injury - Heat Exhaustion - Injury - Hypothermia - Injury - Inhaled/Absorbed/Ingested - Injury - Scrapes/	Multi-select

			Bruises/Cut/Puncture - Injury - Sprain/Strain - Injury - Struck By - Injury - Unconscious - Loss of GPS Signals - Loss of Tow - Port State Detention - Power Instability/Power Loss - Prop Fouling - Property Damage - Propulsion Loss - Shock Hazard/Electrical - Spill (Major/Loss of Containment) - Steering Loss - Unsafe Conditions - Vessel Instability - Water Intrusion - Other - Not Applicable	
23	Actual Consequence	Categorical	- Activation Of Fire Suppression System - Client Cargo Damage/Contamination - Collision/Allision - Contact With Suspended Object - Container overboard - Contamination - Damage - Cargo - Damage - Equipment - Damage - Structural - Dropped Object - Economic/Reputational Damage - Electrical Hazard/Fire - Environmental Hazard (not spills) - Equipment Failure - Extra Work/Time/Cost/Delay - Fall - Fall Into Open Hole - Fall Overboard - Falling Object - Fatigue - Fire/Explosion - Grounding - Hatch Damage - Hull Damage - Injury - Other - Injury - Amputation - Injury - Asphyxia/Choking - Injury - Burn - Injury - Chemical/Radiation Exposure - Injury - Crushing - Injury - Cumulative Trauma - Injury - Disease - Injury - Eye/Vision Impairment	Multi-select

			- Injury - First Aid - Injury - Hearing - Injury - Heat Exhaustion - Injury - Hypothermia - Injury - Inhaled/Absorbed/Ingested - Injury - Scrapes/Bruises/Cut/Puncture - Injury - Sprain/Strain - Injury - Struck By - Injury - Unconscious - Loss of GPS Signals - Loss of Tow - Port State Detention - Power Instability/Power Loss - Prop Fouling - Property Damage - Propulsion loss - Shock Hazard/Electrical - Spill (Minor/Loss of Containment) - Steering Loss - Unsafe Conditions - Vessel Instability - Water Intrusion - Other - None - Not Applicable	
24	Potential Severity Level	Categorical	- Catastrophic - Severe - Moderate - Minor	Modified ASTM categories
25	Causal/Contributing Factors	Categorical	- Act of Violence - Carelessness - Complacency/Laziness - Distraction - Equipment/ Material Failure - Failure to Follow Procedure - Fatigue - Incorrect Procedure - Insufficient Training - Lack of Awareness - Lack of Preventive Maintenance - Lift/Push/Pull Exertion - Localized Vibration - Motion of Vessel - Overexertion, Overload, Ergonomic Factors - Poor Planning - Poor/bad Design - Poor/Insufficient Communications - Rushing Task - Weather - Unknown - Other - Not Applicable	Multi-select
26	Root Cause	Categorical	- Act of Violence	Single Select

			- Carelessness - Complacency/Laziness - Distraction - Equipment/ Material Failure - Failure to Follow Procedure - Fatigue - Incorrect Procedure - Insufficient Training - Lack of Awareness - Lack of Preventive Maintenance - Lift/Push/Pull Exertion - Localized Vibration - Motion of Vessel - Overexertion, Overload, Ergonomic Factors - Poor Planning - Poor/bad Design - Poor/Insufficient Communications - Rushing Task - Weather - Unknown - Other - Not Applicable	

Appendix B: Draft Narrative Guidance

SafeMTS Pilot Study

Draft Narrative Guidance for Near-Miss Event Descriptions

General Tips:

A basic narrative description of a near-miss event should cover what, when, where, who, and immediate corrective action. A better narrative description would also provide information such as causal factors, long term corrective actions, and what might have occurred had the event not been caught (potential consequence). Acronyms should be spelled out or a complementary key provided. Describe human factors involved if applicable and known.

Questions/prompt:

1. What is the vessel name and location?
2. What was going on at the time of the event? For instance, what activity or operation was going on, or what duty were you performing when the incident occurred?
3. If weather was a factor in the incident, identify the weather conditions.
4. Who identified the incident, and were others involved?
5. What equipment or system(s) were involved in or affected by the event?
6. What was done to immediately remedy the situation?
7. Were there any longer-term changes or plans put in place to prevent the event occurring again?
8. What would you change? Which new controls, defenses, or capacity should be added to mitigate potential hazards?[9]
9. What were the main causal or contributing factors that led to the event? What was the root cause of the event?
10. What might have occurred had the event not been caught or stopped? What is the worst consequence that could have occurred had one or more of the safety barriers preventing the event failed or not been in place?
11. What happened the way you thought it would happen?
12. What surprised you?
13. Which hazards did you identify, and which hazards did you miss?
14. Where did you have to "make do," improvise, or adapt?

Below are two sample narrative descriptions:

[9] Questions 8, 11-14 are informed by Todd Conklin's Human and Organizational Performance (HOP) approach and Contact Energy, *Guidelines for Successful Learning Teams* (2017), available at https://www.worksafe.govt.nz/the-toolshed/case-studies/wepr-case-studies/involving-everyone-in-learning-reaps-benefits/.

1. Aboard the MV ClearWaters during general vessel operations, the auxiliary system was believed to have a battery issue so the Second Mate secured the power at the breaker panel to work on the issue. The First Mate believed the entire panel was for the forward system and secured the main breaker to the L-1 panel. The mistake was immediately identified and the breaker was restored to the ON position. The event shut down the forward system and also resulted in the loss of the Stbd. Radar, Gyro#2, and the DP#1 UPS, triggering an alarm. There was no loss of position due to the battery backup and all sensors returned to their normal function. The crew had not been notified of any troubleshooting or need to secure power to the auxiliary system. Immediately following the event the Master spoke with all involved to reiterate that they are to inform the crew before performing any corrective action that requires power to be secured per the standard operating procedure (SOP). After completion of the mission, a safety meeting was held with the crew to review the SOP, the company lock out/tag out (LOTO) procedure and discuss the event.

2. On ATB Maritime, the activation/reset switch for the watertight door system on the bridge was accidentally bumped into the closed position while a chair was being moved, causing the three watertight sliding doors in the engineering spaces to auto-close. The local alarm and 20 second delay notified personnel in that space of a closing. Two electrical extension cords being run through two of the watertight doors were severed. Persons on the bridge were unaware until notified by personnel in affected spaces due to there being no alarm on the bridge panel. The only indication was the small light at each door symbol on the panel. Upon realization of the closure, personnel were notified of the unintended closing of the watertight doors. The activation switch was reset on the bridge and the watertight doors were electrically opened at the local operation switch. The previous day welding leads had been run through the doors and could have caused a worse incident. A temporary cover was immediately placed over the spring-loaded activation switch as an added security measure to prevent accidental operation by being bumped or brushed up against. A more permanent cover will be fabricated. I recommend we add a new procedure to lock-out the watertight doors from being operated remotely whenever cables are routed temporarily through these doors. All cables should always be removed whenever work is not being carried out.

Appendix C: Example MOA

The following MOA template, developed for the SafeOCS Program, is an example of the type of MOA that will be used for SafeMTS.

INDUSTRY SAFETY DATA PROGRAM
BINDING MEMORANDUM OF AGREEMENT

between

THE BUREAU OF TRANSPORTATION STATISTICS
U.S. DEPARTMEMT OF TRANSPORTATION

and

[INDUSTRY PARTICIPANT]

Version 2.0
Effective 2/5/2020

Executive Summary

PURPOSE

The purpose of this Memorandum of Agreement is to create a legally binding relationship between the US Department of Transportation's Bureau of Transportation Statistics (BTS) and individual operators, drilling contractors, and service providers (collectively, the "Participants") operating on the Outer Continental Shelf. The goal of creating these binding relationships is to harness the collective expertise, experience, and knowledge of the Participants, and the independence and statistical capability of BTS in the collection, analysis, and sharing of statistical reports for the identification of potential areas for improved operational and safety focus by Participants.

BTS expects to enter into an identical version of this Agreement with each of the Participants (except Appendices A and B, which specifies the data to be provided and the format and manner in which it will be transmitted to BTS by each individual Participant). The Agreements are structured in a manner that ensures each Participant the opportunity to appoint at least one individual to confidentially participate on either the Data Review Team or the Disclosure Review Team, or both, and the Agreement guarantees that statistical analysis and aggregate results are made available to all Participants.

This joint data reporting, collection, and analysis effort may be referred to as the SafeOCS program, or simply "SafeOCS".

PARTIES

FEDERAL AGENCY:	The Bureau of Transportation Statistics The US Department of Transportation Washington, D.C.
PARTICIPANT:	[Participant Name] [Participant Address: City. State]

Version 2.0
Effective 2/5/2020

MEMORANDUM OF AGREEMENT
BETWEEN
THE BUREAU OF TRANSPORTATION STATISTICS
U.S. DEPARTMENT OF TRANSPORTATION
&
[Participant Name]

1. PARTIES

This legally binding Memorandum of Agreement (the "MOA") is entered into by the Bureau of Transportation Statistics ("BTS"), an office within the U.S. Department of Transportation, and [participant name], a [corporation / limited liability company, etc.], with their primary offices at [physical address] ("[short name]" or "Participant").

This MOA is based on a mutual interest to collect and analyze precursor information to determine statistically significant indicators of potential problems suited to risk reduction measures. The Parties will work together in the spirit of cooperation and open communications, consistent with law.

The U.S. Department of Transportation's mission is to serve the United States by ensuring a fast, safe, efficient, accessible and convenient transportation system that meets our vital national interests and enhances the quality of life of the American people, today and into the future. BTS' mission is to serve as the leading source of timely, accurate, and reliable information on the U.S. transportation systems used for moving people and goods, and on their impacts on the economy, society and the environment.

[Short name for participant] is [description of participant].

2. LEGAL AUTHORITIES

Section 6306 of the Moving Ahead for Progress in the 21st Century Act (MAP-21) (Public Law 112-141) authorizes the BTS Director to enter into agreements with Federal, State, local, or private agencies for the purposes of data collection and analysis.

The Confidential Information Protection and Statistical Efficiency Act, ("CIPSEA"), is a United States federal law enacted in 2002 as Title V of the E-Government Act of 2002 (Public Law 107–347, 116 Stat. 2899). CIPSEA establishes uniform confidentiality protections for information collected for statistical purposes[1] by U.S. statistical agencies.

[1] "CIPSEA defines a statistical purpose to include the description, estimation, or analysis of the characteristics of groups, without identifying the individuals or organizations that comprise such groups and includes the development, implementation, or maintenance of methods, technical or administrative procedures, or information resources that support the above purposes." See Implementation Guidance for Title V of the E-Government Act, Confidential Information Protection and Statistical Efficiency Act of 2002 (CIPSEA), 72 Fed. Reg. 33.362 at 33.367 (June 15, 2007).

3. BACKGROUND

During operations on the Outer Continental Shelf ("OCS")[2] oil and gas exploration, development, and production industry experiences a relatively small number of incidents from which to learn about risks and gaps in risk analysis.

Frequently, it can be difficult to separate transportation-related activities from other activities and operations on the OCS because transportation can play both a direct and indirect role in these operations. Therefore, any operational and safety related data, whether they are directly transportation-related, should be evaluated as a whole. Otherwise, potentially relevant patterns may be overlooked.

Risk management's purpose is to identify potential problems before they occur so that risk reduction measures can be planned and invoked as needed to address adverse impacts over the lifecycle of the operations. The occurrence of safety incidents can potentially be prevented and their impacts can be reduced by analyzing precursor information, near miss information, and other safety data. Nearly all operational accidents and safety-related incidents are preceded by a chain of events, circumstances related to compromised safety limits and their support systems. If these chains of events or circumstances were altered, then accidents and safety incidents could be prevented.

In many cases, oil and gas companies are aware of precursor information, near miss information, and/or safety-related information on similar operations that take place onshore, and other safety data through their own data collection efforts. This data potentially can be used to prevent future adverse events and mishaps.

Several factors have impeded open sharing of precursor information within the industry, one of which is concerns about confidentiality. Confidential safety reporting programs such as SafeOCS address these concerns about confidentiality and non-disclosure as well as the necessity for the de-identification of data and added protection from indirect identification.

The reporting effort will adhere to the following key elements:

- *The purpose of this effort is to identify risks to personnel, the environment, property and other resources related to offshore oil and gas operations, including transportation and other activities that support these operations;*
- *Participation by individuals and companies is entirely voluntary;*
- *All submitted data shall remain confidential;*

[2] "Outer Continental Shelf (OCS)" means all submerged land lying seaward and outside of the area of lands beneath navigable waters as defined in Section 2 of the Submerged Lands Act (43 USC 1301) whose subsoil and seabed appertain to the United States and are subject to its jurisdiction and control. 30 C.F.R. 250.105.

- *Use of all collected data shall be for statistical purposes only; and*
- *Voluntarily submitted data will not be used or shared by BTS for punitive purposes.*

4. CONFIDENTIAL INFORMATION PROTECTION & STATISTICAL EFFICIENCY ACT

The Confidential Information Protection and Statistical Efficiency Act ("CIPSEA"), enacted as Title V of the E-Government Act of 2002 (Pub. L. 107-347, 116 Stat. 2899, 44 U.S.C. § 101), establishes uniform confidentiality provisions for information collected for statistical purposes by U.S. statistical agencies. The purposes of CIPSEA are:

i. to ensure that information supplied by individuals or organizations to an agency for statistical purposes under a pledge of confidentiality is used exclusively for statistical purposes;

ii. to ensure that individuals or organizations who supply information under a pledge of confidentiality to an agency for a statistical purpose will neither have that information disclosed in identifiable form to anyone not authorized to see it nor have that information used for any purpose other than a statistical purpose; and

iii. to safeguard the confidentiality of individually identifiable information acquired under a pledge of confidentiality for statistical purposes by controlling access to, and the uses made of, such information.

In undertaking efforts to obtain information for a statistical purpose under CIPSEA, an agency may designate agents to perform statistical activities on their behalf. Such agents, to include any approved Participant nominees for the Data Review Team and the Disclosure Review Team, must take and subscribe an oath of office or swear to observe the limitations of section 512 of the CIPSEA provisions. Further, such agents must undertake confidentiality training and sign a binding non-disclosure agreement (see attached Appendix C). Any knowing or willful disclosure of information protected under the provisions of CIPSEA in any manner to a person or organization, including Participant, not entitled to receive such information is considered a class E felony and may result in imprisonment for not more than 5 years, a fine of not more than $250,000, or both for the disclosing party.

5. RESPONSIBILITIES AND OBLIGATIONS OF THE PARTIES

The parties to this MOA hereby agree as follows:

Participant

- Participant will, on a voluntary basis, submit confidential data on operation and safety related incidents and near misses to BTS, including a minimum expected set of core data for each incident reported, for statistical analysis through a secure hosting environment. The manner and format for such submissions by Participant shall be consistent with guidance stipulated in Appendices A and B of this MOA, and approved and agreed to by BTS.

- Participant may nominate a plurality of subject matter experts (SMEs) to participate in a pool of potential members of a Data Review Team. All such SME nominees must be reviewed and approved by the SafeOCS Program Manager. Approved SME nominees will serve as BTS agents, as such term is defined in the provisions of CIPSEA, subject to the confidentiality and other provisions of CIPSEA, including the requirement for confidentiality training and the execution of a non-disclosure agreement. Violations of the confidentiality provisions of CIPSEA are a federal criminal offense and are personal to the individual approved BTS agent.
- Participant may nominate at least one representative to participate as a part of a Disclosure Review Team. All such nominees must be reviewed and approved by the SafeOCS Program Manager. All nominees will serve as BTS agents, as such term is defined in the provisions of CIPSEA, subject to the confidentiality and other provisions of CIPSEA, including the requirement for confidentiality training and the execution of a non-disclosure agreement. Violations of the confidentiality provisions of CIPSEA are a federal criminal offense and are personal to the individual approved BTS agent.

BTS

- BTS will develop and implement a database system and a secure hosting environment to support and manage a database of information provided by Participant and others.
- BTS will collect confidential data submitted by Participant, other companies, and individuals solely for statistical analysis as detailed in this MOA.
- BTS will protect the confidentiality of the data submitted under its own confidentiality statute (49 U.S.C. 6307(b)), and CIPSEA.
- BTS will establish and lead (as needed) Data Review Teams, to include employees of BTS and such relevant subject matter experts as are selected from the larger pool of accepted Data Review Team nominees to provide additional information and context to BTS' fuller understanding of emerging safety concerns identified through the initial analysis of the submitted confidential data. In addition to providing BTS a fuller understanding of such areas of concern, each Data Review Team will develop a report highlighting:
    i. the emerging safety concern discussed; and
    ii. a summary of the discussion of such emerging safety concern.

  A copy of such report will be provided to all data contributors.
- As deemed necessary, BTS may follow up a meeting of a Data Review Team by submitting a survey instrument to each of the team members with the provision for individualized recommendations of additional data fields to be collected for a closer analysis of the specific operational and/or safety area of interest discussed during such Data Review Team's meeting.

- BTS will establish and lead a Disclosure Review Team, to include employees of BTS and such individuals as are nominated by Participant and approved by the SafeOCS Program Manager, and other data contributors. The Disclosure Review Team will review all final documents prior to dissemination. The Disclosure Review Team will ensure that the identity of individuals and data contributors are protected from direct and indirect disclosure. Based on the Disclosure Review Team's discussion of each document, the final determination of whether to disclose a document will be at the sole discretion of the BTS Confidentiality Officer;
- BTS will develop user interface tools to provide Participant secure access to its own data; and
- BTS will develop online analytical tools to allow Participant to conduct its own analysis of all data residing in the secure database, without disclosing incident specific or data contributor identifiable information.

6. COMMUNICATIONS

BTS will recognize Participant as a "partner" for this effort by crediting Participant by name in any press or publicity that is related to the effort and which mentions all of BTS's other "partners" in this effort. The Parties will collectively coordinate all publicity and press during this effort. Both parties to this MOA will exert their best efforts to obtain prior approval from the other party for the use of any descriptive language describing the other party in a press release or other written public statement.

Other than the transfer of data as described in Appendices A and B, all official communications (i.e., notices, communications, and coordination) shall be directed as follows:

Bureau of Transportation Statistics:
Bureau of Transportation Statistics
United States Department of Transportation
Attn: Demetra Collia
1200 Jersey Ave SE, Washington DC 20590
Room E36-302
(202) 366-1610

[Participant's Name]:
[Participants full name]
Attn: [A Specific Point of Contact]
Participant's address
Participant's POC phone number

7. FINANCIAL RESPONSIBILITIES

This MOA is not a financial or funding obligation document or any commitment of funding by either party. Each party will directly fund its own participation under this MOA and this effort. Any activity that involves payment for services related to this MOA will be reflected in an appropriate funding document according to applicable rules and regulations of the party providing the funds. All activities by the BTS under or pursuant to this MOA are subject to the availability of federally appropriated funds, and the parties intend that no provision of this MOA will be interpreted to require obligation or payment of funds by any party.

8. DISPUTE RESOLUTION

In the event of any dispute, question, or disagreement arising out of or relating to this MOA or the breach thereof, the parties hereto shall first use their best efforts to settle such disputes, claims, questions, or disagreement. To this effect, they shall consult and negotiate with each other, in good faith and, recognizing their mutual interests, attempt to reach a just and equitable solution satisfactory to both parties. The parties agree and stipulate that this MOA shall be governed by and construed under the laws of the United States

9. TERMS OF AGREEMENT AND RIGHT OF TERMINATION

This MOA will take effect at the time of execution and will remain in effect until either party gives written notice to terminate this MOA or until this MOA is expressly superseded with another agreement signed by both parties.

Either party may terminate this MOA upon thirty (30) days written notice to the other party, without liability at any time and for any reason. As part of its termination of this MOA, Participant must inform BTS either to return all data submitted by Participant or to destroy such submitted data, or if it is willing to allow all submitted data to remain a part of the SafeOCS database. If Participant agrees to allow its submitted data to remain a part of the SafeOCS database, such indication will be binding on Participant. Should Participant instruct BTS to destroy its data, BTS will provide a certification to Participant of the destruction of such data. All provisions relating to protection of information shall survive termination of this MOA, and including, without limitation, Article 4.

Both parties to this MOA shall comply with all applicable laws and regulations in its performance.

10. SIGNATORY AUTHORITY, MODIFICATION, AND RELATIONSHIP OF PARTIES

The signatories to this MOA represent that they have the authority to enter into this MOA on behalf of their respective organization.

Any modification to this MOA must be executed in writing and signed by an authorized representative of each party.

This MOA does not give either party any authority to act on behalf of or to obligate any funds to be expended by the other party. This MOA may not be assigned by either party. The parties do not intend this MOA to establish a partnership or other type of legal entity and this MOA does not create any rights in any third party. Nothing in this MOA shall be construed as superseding or interfering in any way with other agreements or contracts entered into either prior to or subsequent to the signing of this MOA, nor prevent either party from entering into similar agreements or contracts with other companies or organizations.

By entering into this legally-binding MOA, BTS is confirming that Participant's involvement under this MOA is not a gift from Participant to BTS or the U.S. Department of Transportation, and BTS' participation in this effort is not an endorsement of Participant by BTS, the U.S. Department of Transportation, or the Department's employees. Participant acknowledges that it has no expectation of favorable treatment in pending or future matters, or expectation of other improper benefits from either BTS or the U.S. Department of Transportation because of its participation in this effort.

Executed by:

Patricia Hu
Director
Bureau of Transportation Statistics

Date

[Participant's Name]
[Name of Signatory]
[Title of Signatory]

Date

APPENDIX A

Data Transfer Protocol

[Participant's Name] will transmit their data file to the Bureau of Transportation Statistics (BTS)via the secure data portal located on the SafeOCS ISD web site (www.safeocs.gov).

APPENDIX B

Record Layout and Metadata

[Participant's Name] will submit operational and safety-related incident data using the data structure and fields as listed below.

Minimum Expected Core Data Submissions

While submission of safety data to SafeOCS ISD is voluntary, each participant (as a minimum) is expected to provide the following core data fields to allow more effective data aggregation and analysis. This is especially important for events where multiple submissions are possible by the same company, as well as when multiple companies may submit information on the same event (e.g., operator, drilling contractor, service contractor, construction contractor), as it will allow BTS to identify those incidences and merge the records to generate a more comprehensive event record. Please note that all specific event identifier data are subject to CIPSEA protection and will not be shared with anyone outside of BTS or its agents.

- Unique event identifier (if applicable)
- Event date and time
- Event type (i.e., event with consequences, event without consequences, unsafe actions)
- Event category (e.g., personal safety, dropped object, fire, LOPC, etc.)
- Event description
- Rig and/or platform identification
- Location
- Operator name (for submissions by non-operators)
- Asset type (production, rig, marine vessel, aviation, other)
- Causal factors (if applicable)

Voluntary Core Data Submissions (not all data fields may be populated for every event)

- Actual consequences (for events with consequences)
- Potential consequences (for event without consequences, if available)
- Process safety event (yes/no)
- Process safety tier level (as defined by IOGP 456)
- Operation type (general category of operation that was occurring at the time of the event)
- Primary activity type (specific activity that was being performed at time of event)
- Location on facility (specifically where on assert or facility that event occurred)

- Injury/illness classification (e.g., fatality, lost work, restricted work, medical treatment, first aid, non-treatment)
- Body part affected
- Injury type
- Fuel type (for fires and explosions)
- Source of ignition (for fires and explosions)
- Duration of fire (for fires and explosions)
- Material released (for loss of primary containment)
- Onsite vs. offsite (for loss of primary containment)
- Reporting volume (for loss of primary containment)
- Property or equipment damage (free text)
- Object dropped (free text)
- Causal factor narrative
- Event corrective actions

Notes:

1. If your company's database does not include all of the core data fields noted above, please ensure (to the extent practicable) that this information is addressed in the event description.
2. Additional data fields may be submitted if they are already captured in your company's database; there is no need to delete or redact those fields since all data transmitted to BTS is subject to CIPSEA protections.

APPENDIX C

See Next Page for Non-Disclosure Agreement

Non-Disclosure Agreement and Bureau of Transportation Statistics
CIPSEA Training Certificate for Access to Confidential Data

The undersigned, _____, an approved nominee of _____, (hereinafter referred to as "Agent") hereby acknowledges and agrees to the following terms and conditions required for approval of their individual participation as a part of the Data Review Team / Disclosure Review Team (circle team(s) to which agent has been assigned) for the SafeOCS program.

I. The Agent shall:

(a) for all purposes and with regard to all information shared by the Bureau of Transportation Statistics (BTS), be considered an "agent" of the BTS for the SafeOCS program as the term is defined in the Confidential Information Protection and Statistical Efficiency Act (CIPSEA; Pub. L. 107-347, Title V, Section 502(2)) and in accordance with Section 512 of CIPSEA;

(b) be restricted to performing exclusively statistical activities under the control of an officer or employee of the BTS; and

(c) at all times protect from disclosure all information shared with him/her in accordance with the requirements of CIPSEA, which provides that any employee, contractor, or agent who willfully discloses confidential information in any manner to a person or agency (including his/her employer) not otherwise entitled to receive it, shall be guilty of a class E felony and imprisoned for not more than 5 years, or fined not more than $250,000, or both.

II. The Agent acknowledges that none of the above requirements conflicts with the Whistleblower Protection Enhancement Act of 2012 (WPEA) and that the provisions of this agreement are consistent with and do not supersede, conflict with or otherwise alter the Agent's obligations, rights, or liabilities created by existing statute or Executive order relating to (1) classified information, (2) communications to Congress, (3) the reporting to an Inspector General of a violation of any law, rule, or regulation, or mismanagement, a gross waste of funds, an abuse of authority, or a substantial and specific danger to public health or safety, or (4) any other whistleblower protection. The definitions, requirements, obligations, rights, sanctions, and liabilities created by controlling Executive orders and statutory provisions are incorporated into this agreement and are controlling.

III. The Agent acknowledges that they shall be personally and solely responsible for any violation of the provisions of CIPSEA regarding the release of information gained as a member of a Data Review Team or the Disclosure Review Team (circle team(s) to which agent has been assigned), regardless of the recipient of such information, except as set forth in clause II of this Agreement.

IV. Your signature below indicates that you have received confidentiality training and that you have carefully read and understand your obligations and responsibilities as an Agent of the BTS under CIPSEA. You further acknowledge that if you violate the confidentiality provisions of CIPSEA Section 512 or make an unauthorized disclosure, you may be found guilty of a class E felony and can be imprisoned up to five years, and/or fined up to $250,000, or both. You also understand that violations of information system security and practices may lead to immediate dismissal as an Agent of BTS, and civil or criminal prosecution.

Print Name

Signature

Date of Confidentiality Training

Confidentiality Training Provided by: Demetra Collia, BTS Confidentiality Officer

Appendix D: SafeMTS Stakeholders

A partial list of stakeholders is provided below.

- Commercial Companies:
    - Container and Bulk Carrier Operators
    - Cruise Line Operators
    - Offshore Oil and Gas Operators
    - Offshore Wind Operators
    - Passenger Vessel Operators
    - Tanker Operators
    - Tug and Barge Operators
- Maritime Unions and Associated Training Institutions
    - International Organization of Masters, Mates & Pilots (MM&P)/Maritime Institutes of Technology and Graduate Programs (MITAGS)
    - Marine Engineers Beneficial Association (MEBA)/Calhoun Engineering School
    - Seafarers International Union (SIU)/ The Seafarers Harry Lundeberg School of Seamanship
- Maritime Industry Associations
    - American Waterway Operators (AWO)
    - Cruise Lines International Association (CLIA)
    - Lakes Carriers Association (LCA)
    - National Safety Council/Waterborne Transports Group
    - Offshore Marine Service Association (OMSA)
    - Passenger Vessel Association (PVA)
    - Ship Operations Cooperative Program (SOCP)
- Classifications Societies
    - American Bureau of Shipping (ABS)
    - Det Norske Veritas (DNV)
    - Lloyds Register of Shipping (LR)
- Department of Transportation (DOT)
    - Maritime Administration (MARAD)

    - Bureau of Transportation Statistics (BTS)
- Department of Interior (DOI)
    - Bureau of Safety and Environmental Enforcement (BSEE)
    - Bureau of Ocean Energy Management (BOEM)
- Dept. of Commerce, Nat'l Oceanic & Atmospheric Administration (NOAA)
- Federal and State Maritime Academies
- Maritime Government Agencies
- Maritime Safety Reporting Systems
- National Transportation Safety Board (NTSB)
- Navy/Military Sealift Command (MSC)
- United States Coast Guard (USCG)
- U.S. Army Corps of Engineers (USACE)
- Confidential Human Factors Incident Reporting Programme (CHIRP)

Appendix E: Statements of Support

"Crowley enthusiastically continues to collaborate and support the development of SafeMTS. Crowley has made safety essential in all that we do wherever we operate, and we emphasize proactive actions to identify risks by using analysis to uncover hidden or unobserved conditions. We see current and future value in sharing incident and near-miss information to help us all learn together as an industry while helping to improve our own operations and safety management systems."

– Peter Sutton, Vice President, HSSQE, Crowley Shipping

"The American Waterways Operators, the advocate and unified voice for the tugboat, towboat, and barge industry, has appreciated the opportunity to collaborate with SafeMTS to support the development of a voluntary and secure safety data system focused on leading indicators. The importance of collecting and sharing near-miss information and lessons learned to reduce the risk of a future incident cannot be overstated and we are committed to working with AWO's members and government and industry partners to collect accurate and actionable safety data and promote continuous safety improvement throughout the Marine Transportation System."

– Michael Breslin, Director – Safety and Sustainability, American Waterways Operators

"Hornblower, an international leader in hospitality and maritime transportation, plans to participate in the SafeMTS system. Hornblower has a rich tradition as an industry leader in safety. Hornblower is committed to safety as a top priority, utilizing data-driven decisions and innovative technology to provide millions of annual passengers, riders and visitors with safe passenger vessel experiences around the globe. The SafeMTS will offer Hornblower and MARAD an excellent tool to build continued depth of safety knowledge in the domestic small passenger vessel industry."

– Richard J. Paine, Jr., Vice-President, Quality Assurance (HSSQE) & Proposal Management, Hornblower Group

"As a ship operator and as a company with robust Safety, Quality and Environmental Management Systems, we view the SafeMTS initiative as a beneficial tool to improving the safety and operations of our vessels. […] We strongly believe that the SafeMTS initiative is a valuable tool to improve the safety and operations of marine vessels and that it was an effort which was long overdue. We look forward to its implementation throughout the industry and the benefits which we will gain from participation."

– Captain Robert V. Sheen – President/COO, Ocean Shipholdings, Inc., Ocean Ships, Inc., Ocean Duchess, Inc.

Appendix F: NTSB Letter of Support

National Transportation Safety Board

Office of the Chair

Washington, DC 20594

October 3, 2023

Docket Services
U.S. Department of Transportation
1200 New Jersey Avenue SE
West Building, Ground Floor, Room W12-140
Washington, DC 20590-0001

ATTN: Docket No. OST-2023-0115.

https://www.regulations.gov

Dear Sir or Madam:

The National Transportation Safety Board (NTSB) has reviewed the Bureau of Transportation Statistics' (BTS) notice of its intention to request that the Office of Management and Budget approve a new data collection titled "SafeMTS—Voluntary Near-Miss Reporting and Analysis Program for the Maritime Transportation System" as published at 88 *Federal Register* 151 on August 8, 2023. In its notice, the BTS requests public comments on this information collection system.

As described in the notice, although the maritime sector experiences many more near-misses than actual casualties, near-miss reporting is not required under current regulations, and there is no confidential reporting system in place in the US for the maritime industry to report near-miss safety incidents and other non-casualty safety matters. The intention of the SafeMTS program is to provide the means for companies—who would voluntarily participate in the program—to confidentially report sensitive and proprietary safety information regarding near-miss or other safety incidents. Through this collection of information, the BTS proposes that the marine industry could identify safety issues by analyzing reported incidents before a casualty occurs.

The NTSB agrees with the BTS that near-miss reporting would benefit the maritime industry in US waters, and we have previously supported near-miss reporting systems as a way to obtain critical information to improve marine safety. For example, in 2016, the NTSB conducted a study of the effectiveness of the US Coast Guard's Vessel Traffic Service (VTS) program, which collects data on near-misses and

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other incidents.[1] One of the issues identified in the report was confusion and disagreement among VTS directors about what constituted a vessel near-miss incident. We found that the inconsistent collection of near misses and other activity and incident data did not support effective quantitative assessment of risk and safety performance within VTS areas. As a result, we issued Safety Recommendation M-16-19 to the Coast Guard to establish a program to periodically analyze the activity and incident data collected by VTS centers to assess the safety performance of each VTS center and the entire VTS system. (This recommendation is currently classified Open–Acceptable Response.)

Near-miss reporting has already been encouraged and implemented in the maritime community internationally. For example, the International Maritime Organization's International Safety Management Code encourages shipping companies to report near misses. Guidance from the International Maritime Organization recommends that companies encourage a "just-culture" approach and assure the confidentiality of reports by mariners and other individuals. By removing disincentives to reporting, such as fear of discipline or penalties due to violations of regulations, near-miss databases capture the information and circumstances from incidents that might not otherwise be known until a catastrophic casualty occurs.

We have seen how voluntary, non-punitive near-miss reporting has been successful in other modes of transportation–for example, aviation–and we believe confidential, non-punitive reporting is one of the keys to a program's success. In 1976, the Federal Aviation Administration (FAA) and National Aeronautics and Space Administration (NASA) established the federal government's first formal confidential near-miss reporting system, the Aviation Safety Reporting System (ASRS), through which pilots, controllers, and others could voluntarily and confidentially submit aviation safety incident reports. To encourage individuals to report incidents, the FAA grants limited immunity to individuals who file reports through ASRS. According to NASA, the ASRS had securely processed over 1.9 million reports between the program's inception and 2022, demonstrating that individuals are willing to share their knowledge of events if there are no disciplinary or legal consequences and they are assured confidentiality. A near-miss reporting system like ASRS also provides valuable safety information (data and trends) to industry and others in order to help identify and mitigate risks to prevent casualties. Analysis of these reports has resulted

[1] *An Assessment of the Effectiveness of the US Coast Guard Vessel Traffic System*, SS-16/01, Washington, DC: NTSB, 2016.

in the dissemination of over 7,000 safety alert messages to industry, and the NTSB often relies on these data to support our safety recommendations.[2]

The Confidential Close Call Reporting System (C³RS) is a similar voluntary near-miss reporting system for the railroad industry. The C³RS, modeled after ASRS, is a partnership between NASA and the Federal Railroad Administration that was launched in 2011. Since then, over 25,000 voluntary close call reports have been made and analyzed to improve safety.

Since the establishment of ASRS and C³RS, we have issued recommendations to transportation operators, labor unions, and regulators to encourage specific groups to submit information to these or other similar reporting systems. Safety Recommendation A-81-154 recommended that the FAA emphasize the use of ASRS by controllers to report hazardous conditions.[3] Safety Recommendation A-83-40 recommended that the FAA provide guidance to air traffic controllers to use the ASRS to supplement existing incident reporting. Safety Recommendation A-89-49 recommended that the FAA encourage pilots to report unique experiences encountered in international flight operations to the ASRS. Safety Recommendation R-17-025 recommended that AMTRAK develop and implement a viable safety reporting system such as C³RS. Safety Recommendation R-19-35 recommended that the Metropolitan Transit Authority for New York City modify its current close call reporting system to include anonymous and confidential reporting of hazards and near misses. All of these safety recommendations have been classified Closed–Acceptable Action.

According to the description of the proposed BTS program, currently only companies will be able to submit reports of near-miss incidents to SafeMTS. However, we believe that SafeMTS should accept reports from individuals as well as companies. One of the reasons near-miss programs like ASRS have been successful is because

[2] Examples of reports in which the NTSB has referenced near-miss reporting system data include the following: *Attempted Takeoff From Wrong Runway, Comair Flight 5191, Bombardier CL-600-2B19, N431CA, Lexington, Kentucky, August 27, 2006*, AAR-07/05, Washington, DC: NTSB, 2007; *Descent Below Visual Glidepath and Impact With Seawall, Asiana Airlines Flight 214, Boeing 777-200ER, HL7742, San Francisco, California, July 6, 2013*, AAR-14/01, Washington, DC: NTSB, 2014; *Crash During a Nighttime Nonprecision Instrument Approach to Landing, UPS Flight 1354, Airbus A300-600, N155UP, Birmingham, Alabama, August 14, 2013*, AAR-14/02, Washington, DC: NTSB, 2014; *Taxiway Overflight, Air Canada Flight 759, Airbus A320-211, C-FKCK, San Francisco, California, July 7, 2017*, AIR-18/01, Washington, DC: NTSB, 2018; and *Rapid Descent and Crash into Water, Atlas Air Inc. Flight 3591, Boeing 767-375BCF, N1217A, Trinity Bay, Texas, February 23, 2019*, AAR-20/02, Washington, DC: NTSB, 2020.

[3] Visit ntsb.gov to find additional information on these safety recommendations. Use the CAROL Query to search safety recommendations and investigations.

individuals (such as pilots, dispatchers, controllers or maintenance technicians) are encouraged to report near-miss incidents and are not required to receive the approval of their employer to do so. Additionally, as the SafeMTS database matures, we encourage the BTS to accommodate search requests from other agencies and the interested public, as the ASRS does, to maximize the public safety benefit of this data.

The NTSB supports the implementation of the SafeMTS program to collect information on marine near-misses and other safety incidents. As stated above, we have used information from ASRS to develop a better understanding of safety issues revealed in our investigations. A similar near-miss reporting system for the marine industry would help inform our marine investigations, as well as others in the marine industry, by providing valuable information about continuing and emerging safety problems that would not otherwise be known until the occurrence of a catastrophic accident involving possible loss of life or significant property damage.

Thank you for the opportunity to comment on this notice.

Sincerely,

Jennifer Homendy
Chair