MAINE STATE LEGISLATURE

Maine State Ferry Service

MaineDOT

Operational Safety Assessment (OSA) Report

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Table of Contents

1 Introduction

The Maine Department of Transportation (DOT), Maine State Ferry Service (MSFS) retained SAFETY MANAGEMENT SYSTEMS, LLC (SMSLLC) to coordinate and perform an operational safety assessment of the MSFS marine operations. The goal of this assessment is to benchmark current MSFS marine operations with respect to regulatory compliance and accepted ferry industry practice. Additionally, SMSLLC was requested to offer recommendations regarding corrective action to any identified lapses and suggestions for the improvement of MSFS operations.

This report documents the results of the operational safety assessment as supported by SMSLLC. The assessment incorporated an objective review of activities performed by MSFS including both ferry and terminal operations.

Throughout the assessment, all MSFS personnel have been forthright and forthcoming with essential information in the interest making the review process as productive as possible. SMSLLC is thankful for and appreciative of the attitude and commitment of MSFS personnel to improve upon existing arrangements.

1.1 MSFS Operations and Organization

Operations

MSFS, as a division of the Maine DOT Office of Passenger Transportation, provides scheduled passenger and vehicle service to Vinalhaven and North Haven from Rockland, to Islesboro from Lincolnville and Swan's Island from Bass Harbor on a daily basis. Additionally, service is provided three days per week to Frenchboro from Bass Harbor. There is also scheduled service (31 times in 2007) to Matinicus Island from Rockland. Each ferry is in operation for approximately ten to twelve hours per day.

Service is provided via a system of five dedicated and two stand-by ferryboats. The service runs of each ferry are as follows[1]:

- Vinalhaven - *Captain Charles Philbrook* and *Governor Curtis*;
- North Haven - *Captain Neal Burgess*;
- Islesboro - *Margaret Chase Smith*;
- Swan's Island - *Captain Henry Lee*;
- Frenchboro - *Captain Henry Lee*; and
- Matinicus Island - normally by *Everett Libby* or *North Haven* (stand-by boats).

MSFS maintains ticket office facilities on both the mainland and island terminus for each serviced route. The Rockland terminal also provides the offices for the shore-based management team.

Each terminal has a transfer arrangement that consists of the transfer bridge and ferry pen. This provides the method of access to and from the ferry for both vehicle and foot traffic. Maine DOT, Bureau of Maintenance and Operations is tasked with maintenance and repair of this ferry/shore interface.

[1] See Appendix A – Ferryboat Particulars for technical details regarding each vessel.

The ferry service maintains crew housing on the islands of Vinalhaven, North Haven, Islesboro and Swan's Island. By housing personnel overnight on these islands ferry personnel are available to be called out by local emergency response units to provide transportation services to the mainland.

Each ferry is operated in accordance with applicable U.S. Coast Guard regulations. The majority of vessels are regulated under Title 46 U.S. Code of Federal Regulations, Subchapter H – *Passenger Vessels*. The only exception is the Margaret Chase Smith, which due to her smaller gross tonnage than the remainder of the fleet, is regulated under Title 46 U.S. Code of Federal Regulations, Subchapter K – *Small Passenger Vessels Carrying More Than 150 Passengers or With Overnight Accommodations for More Than 49 Passengers.*

The requirements of both regulations are similar in many regards and require periodic U.S. Coast Guard inspections onboard each vessel to verify continued conformance with U.S. law.

Organization

The standard crew size for each ferry, with the exception of the *Margaret Chase Smith* is four and consists of the Master (Captain), two Able Bodied Seamen (AB) and a Licensed Engineer. Due to her configuration, and in accordance with U.S. Coast Guard certification, the *Smith* carries an Ordinary Seaman (OS) as an additional crewmember. Each crew is properly licensed and/or credentialed by the U.S. Coast Guard for the position that they hold onboard. Each full time crewmember is assigned to a specific ferry/run. The normal work day should not exceed twelve hours by U.S. Coast Guard regulation. This work day may be extended in response to an emergency situation or for the purpose of drills. The standard work rotation is seven days onboard followed by seven days off. There is also a relief crew who provide the primary source of coverage for any regularly scheduled crewmember that might be unavailable. These relief crew personnel are essential as the ferry cannot proceed on its scheduled run without all crew positions being properly filled. During their time off personnel may, on a voluntary basis, work as a relief onboard to fill a position for which they are qualified when the regularly scheduled crewmember is unavailable.

The operating crews and ferry boats are supported by a senior management team located within the Rockland terminal. Senior management consists of a Ferry Service Manager, Port Engineer, Port Captain, Warehouse Supervisor, Office Supervisor and Transportation Planning Analyst.

Each terminal is staffed with a minimum of two agents during operating hours. One agent is engaged in operational activities while the second performs security related functions.

1.2 Assessment Scope and Methodology

Scope

The scope was defined to include onboard attendance for each operational ferry and terminal serviced by MSFS to ensure an adequate review of arrangements in support of human resources; management and administration; navigation, cargo and deck operations; engineering and maintenance operations; and environmental, health and safety (EHS) programs.

A discussion of each of these areas is provided in the following section 2 *Observations and Recommendations*.

In addition, while not intending to duplicate a U.S. Coast Guard inspection for conformance with regulations, this assessment accommodated a review of MSFS operational arrangements that conform to ferry industry best practices, including the SMSLLC-recommended regulation 33 CFR Part 96 *Rules for the Safe Operation of Vessels and Safety Management Systems*[2].

Methodology

SMSLLC, prior to commencing the assessment of MSFS operational practices, developed a checklist to use while assessing each ferry and a checklist to use when observing terminal operations[3]. SMSLLC used a combination of United States Code, industry best practices and company experience in the development of these checklists.

The purpose of these checklists was to facilitate a consistent, yet comprehensive, assessment of each location. This allowed SMSLLC to determine if problems were isolated to a particular location/ferry or if identified issues were common throughout the ferry system.

Onsite review activities were facilitated through a combination of assessment techniques including the following:

- Interview;
- Activity observation;
- Instruction review (policy, procedure, directive, instruction, memo, etc);
- Record review; and
- General condition assessment.

This review report was developed by SMSLLC to capture all pertinent observations recorded throughout the assessment. The report was drafted by the SMSLLC project manager and provided to the MSFS project manager for review and comment.

Revisions to the assessment report were processed and approved by the SMSLLC project manager to ensure accuracy, objectivity and usefulness to the objectives of the operational safety review.

[2] Conformance to the cited regulation is anticipated to become mandatory for all operators of ferries within the U.S. as a result of an accident involving a New York City Department of Transportation ferry in 2003. See Appendix D for a copy of a *Safety Recommendation* dated 18-Mar-05 from the National Transportation Safety Board to Governors that encourages voluntary application of the regulation.

[3] See Appendix B for a sample Ferry Operations Checklist and Appendix C for a sample Terminal Operations Checklist.

1.3 Executive Summary

MSFS has been a successful operator for many years and has never suffered a major casualty involving one of its vessels. The organization is staffed by a core group of dedicated maritime professionals who do effective job in maintaining the continuity of its operations and compliance with U.S. Coast Guard Regulations.

Nothing that was observed by SMSLLC during its assessment constituted evidence of a systemic failure of the organization to provide for safe operations. Neither were any witnessed operations indicative of negligence or reckless behavior. Vessel personnel were observed to be competent in the performance of their duties to operate ferries on all routes. Operator complacency is a common concern within the ferry industry due to the repetitive nature of the work involved. SMSLLC has not commented in this area within its assessment observations, though it does believe that this concern has legitimacy for MSFS. Collectively addressed, the recommendations within this report would serve well to counteract the potential for complacency throughout the organization.

While maintaining a strong record of compliance with U.S. Coast Guard regulations, it is apparent that MSFS has not been attuned to developments within the ferry industry that constitute best practice for many operators as noted in a number of observations. As for any vessel operation that has not fully established effective operational controls, MSFS is at a fair to moderate risk of experiencing a future serious marine incident[4] that may involve a vessel accident and/or pollution incident.

As emphasized within the *Recommended Action Plan* (see section 3 of this report), the MSFS Manager should be provided with the necessary resources to support implementation of recommendations within this report. Further, Maine DOT must recognize that implementation of recommendations may only be sustained over time provided that it is willing and committed to ensure that sufficient resources are routinely allocated and provided to MSFS.

The following summarizes those observations of greatest concern to SMSLLC based on its observations. Specific details for each item are provided within the referenced sections.

- Verification Activities (see section 2.2.4) - *MSFS has not supported verification activities to determine whether its policies and requirements are actually implemented. In addition, a system has not been established to coordinate a review of existing requirements to plan for future improvements.*
- Passenger Safety (see section 2.3.3) - *Basic passenger safety measures including vessel departure safety orientations and frequent rounds by crewmembers of passenger accommodation areas were not observed during the assessment.*
- Navigation System Update (see section 2.3.4) – *Navigation information as provided by paper and electronic charts was observed to be outdated or of suspect currency onboard several vessels.*
- Terminal Maintenance (see section 2.4.1) – *Several terminals attended by SMSLLC exhibited damage within pens that has reportedly been unattended to for some time and that contributes to undue vessel wear and tear.*

[4] The U.S. Coast Guard defines a "serious" incident as a marine casualty involving death, injury that requires professional medical treatment beyond first aid, damages in excess of $100,000.00, or a discharge of a reportable quantity oil or hazardous substances into navigable waters

- Oil Transfer Procedures and Spill Response Equipment (see section 2.4.3) – *Suitable precautions were not observed prior to and during fuel and lube oil transfer operations as witnessed for one vessel.*
- Automated Electronic Defibrillators (AED) (see section 2.5.1) - *While not required by regulation, many ferries now carry an Automated External Defibrillator (AED). AED have saved the lives of both passengers and crewmembers. None of the MSFS vessels were observed to have an AED onboard.*

2 Observations and Recommendations

Observations have been presented within topical areas as described within the following Figure 2. The topical areas represent the four major areas of control[5] to achieve safe and effective vessel operations.

Note that within each topical area, observations have not been listed in any particular order of importance.

Figure 2 – Categories of Observations

Topical Area		Explanation
2.1	Human Resources	Includes broad concerns relating to the organizational and personnel issues including qualifications, responsibilities, training and drills, medical fitness standards, drug and alcohol programs, etc.
2.2	Management and Administration	Includes broad concerns relating to the management of arrangements necessary for the support of vessel operations such as the establishment of effective policies and requirements, organization and staffing, training programs and cultivation of human resources, financial resources in support of asset acquisition and preservation.
2.3	Navigation, Cargo and Deck Operations	Includes concerns relating to vessel navigation, watchstanding, loading and discharging passengers and vehicles, mooring and miscellaneous tasks performed on deck.
2.4	Engineering and Maintenance Operations	Includes concerns relating to operations conducted in engine rooms and machinery spaces, watchstanding, planned maintenance programs as well as measures to effectively accomplish corrective maintenance.
2.5	Environmental Health and Safety (EHS) Programs	Includes concerns relating to the implementation of OSHA requirements as well as additional safe working practices and pollution prevention measures applicable to vessel operations as required by U.S. Coast Guard, U.S. Environmental Protection Agency, etc.

[5] "Control" is established through effective implementation of policies, procedures, responsibilities and authorities and through verification measures to ensure that stated requirements are implemented, sufficient and effective for their intended purpose.

The next section presents each observation in the following format so as to best organize pertinent details:

- Summary — *Statement of fact as determined by SMSLLC during the assessment.*
- Discussion — *Supporting information and data to more fully describe the nature of the observation.*
- Reference — *Affords reference to pertinent documented regulations, standards, requirements or guidelines. Note that in some cases the reference may not in itself constitute a legal obligation for MSFS, though conformance is recommended by SMSLLC. Such cases have been clearly identified within the reference. In addition, records or other factual evidence obtained by SMSLLC during the review may be identified in this section as appropriate.*
- Recommended Corrective Action — *Describes the recommended measures to resolve the observation based on available information.*

2.1 Human Resources

2.1.1 Crew Changes

Summary-

A standardized process for the exchange of essential information between departing and joining ferry crews has not been established.

Discussion-

(a) Captains reportedly provide turnover information to their relieving Captains through various informal means (e.g., in person, via telephone, rough notes, etc.). Captains may or may not have an opportunity to see their relief in person.

(b) Licensed Engineers appear to support the exchange of information in similar fashion to Captains. It was noted that while most Licensed Engineers have been employed by MSFS for many years and are extremely familiar with their respective plants, such familiarity may lead to assumptions regarding the operational status of machinery and systems that may be in error.

(c) While a specific regulatory requirement regarding this process does not exist, it is established industry practice to standardize the process by which crew changes are effected so as to ensure an adequate exchange of essential information. Such information may include the status of vessel machinery and systems, ongoing construction, particular U.S. Coast Guard notices regarding operating areas, problems experienced during the previous week that may impact subsequent vessel operations, etc.

Reference-

- 33 CFR 96 Table 96.250 (f) (5)

Recommended Corrective Action-

(1) Establish and document a standardized process in support of crew changes. The process should define requirements regarding the type of information to be exchanged as well as the methods for doing so.

2.1.2 Duties and Responsibilities

Summary-

Maine DOT "job descriptions" for MSFS personnel are of questionable accuracy and do not sufficiently correlate duties with established policies and procedures.

Discussion-

(a) Job descriptions are not "controlled" with respect to date of issue, revision or approval authority. SMSLLC could not determine the currency of these documents as provided. "Representative tasks" contained within these documents were observed to provide generalizations and were further confused by a statement provided on each job description that "a position may not be assigned all the duties listed".

(b) Regulations address the requirement to establish "responsibility, authority and interrelations of all personnel who manage, perform, and verify work relating to and affecting the safety

and pollution prevention operations of the company and vessels". In addition, it is established industry practice to ensure that such details for each position clearly communicate expectations regarding the actual policies and procedures that each individual is responsible to implement to eliminate the chance for confusion.

(c) Regulations also address the requirement for vessel operators to clearly indicate that their Captains have their support in making decisions in the best interest of safety and pollution prevention – even when such decisions may compromise operations (e.g., cancelled trips, etc.). It was observed and discussed with several Captains that they believe they have the support of MSFS in this regard as trips have been cancelled for reasons including weather conditions, crew fatigue, etc. with no negative consequences for the Captains.

Reference-

- 33 CFR 96 Table 96.250 (b) (e)
- 46 CFR 78.30 and 122.410

Recommended Corrective Action-

(1) Establish clearly documented responsibilities for each shore-based and vessel position for tasks relating to the support of operations. For ferry personnel, responsibilities must be established for each position as identified on the U.S. Coast Guard Certificate of Inspection for each vessel.

(2) Responsibilities for "Captain" should clearly indicate that this position has the "overriding authority" to make decisions regarding safety and pollution prevention and the ability to request assistance from MSFS when necessary.

(3) To the maximum extent practicable, ensure that responsibilities reference the actual MSFS documented requirements (e.g., policies, procedures, etc.) that pertain to each position.

(4) Ensure that documented responsibilities, and all documentation to be issued in support of MSFS operational policies, procedures and requirements, are provided with controls to ensure that revision status and veracity are clearly established.

2.1.3 Qualifications

Summary-

Qualifications and training requirements have not been established in writing for MSFS personnel. In addition, MSFS does not have an effective system to verify that all personnel maintain valid qualifications (i.e., U.S. Coast Guard licenses, endorsements and documents) at all times.

Discussion-

(a) The minimum U.S. Coast Guard license criteria for Captains and Licensed Engineers is known but not documented. The same holds true for deckhands who are expected to possess a Merchant Mariners Document (MMD).

(b) While U.S. Coast Guard licenses and documents are valid for a period of 5 years, MSFS personnel have not been requested to provide copies of renewal documents to appropriate management once obtained. This is concerning insofar as industry experience indicates that not requiring this essential verification by management leads to lapses in individual

compliance. MSFS should maintain an accurate accounting of the validity of the professional licenses, endorsements and documents for all of its personnel.

(c) MSFS personnel are only expected to provide copies of U.S. Coast Guard licenses and documents as part of the initial hiring process.

(d) While not specifically required under regulation for MSFS personnel, International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW) Basic Safety Training (BST)[6] has not been provided. It is fast becoming established industry practice to provide such training once for all vessel personnel. Many vessel operators now view the satisfactory completion of this training as a professional qualification for being hired.

Reference-

- 33 CFR 96 Table 96.250 (f)
- 46 CFR 10 (various parts)

Recommended Corrective Action-

(1) Establish documented qualifications for each shore-based and vessel position that indicate the minimum level of U.S. Coast Guard professional credentials, training and experience to perform related duties.

(2) Establish and document a standardized process in support of coordinating renewals of qualification documents for all personnel. At a minimum, the process should provide for effective tracking of expiration dates, notification of personnel of pending expiration dates and verification of all renewal records. Further, MSFS should establish an effective system to maintain copies of qualification records for all personnel.

(3) MSFS should consider the coordination of STCW BST training for all of its vessel personnel. It is recommended that this training be provided just once for all personnel. It is suggested that such training be provided for new personnel at the earliest opportunity following the hiring process.

2.1.4 Medical Standards

Summary-

Aside from the initial hiring process and as a consequence of U.S. Coast Guard license and document renewals, MSFS has not established a method to verify the continued medical fitness of its personnel.

Discussion-

(a) Records to confirm the medical fitness of vessel personnel are not provided to MSFS after initial hire. The U.S. Coast Guard requires the satisfactory completion of a medical examination to renew any issued license or document, though the interval between such renewals is 5 years.

[6] STCW BST is frequently offered by a number of training institutions including the Maine Maritime Academy and includes modules that address personal survival, personal safety and social responsibility, elementary first aid and CPR, and firefighting.

(b) While a specific regulatory requirement regarding the need for a vessel operator to establish a method to ensure the continued physical fitness of its personnel does not exist, it has become industry practice for management to establish medical examination standards that may exceed U.S. Coast Guard requirements with respect to the frequency of such examinations.

(c) Note that the U.S. Coast Guard requires *annual* medical examinations for Pilots in order to maintain the continued validity of their professional credentials. While MSFS Captains are not required under the regulations to obtain and maintain pilotage endorsements for their U.S. Coast Guard licenses, they do perform equivalent duties and need to maintain a high degree of navigational competence to ensure the safe transport of passengers and cargo.

(d) While Maine DOT medical examination requirements may not require periodic medical examinations for personnel working in other divisions, the Agency is cautioned that it is likely that no other personnel serve in such "safety sensitive" positions as its MSFS Captains.

(e) It is possible that some MSFS personnel are obligated by the U.S. Coast Guard, due to a known medical condition, to successfully complete an annual examination in order to maintain the validity of their license. Under existing arrangements, MSFS does not maintain suitable records to verify that such examinations, if required, are completed.

Reference-

- 33 CFR 96 Table 96.250 (f)
- 46 CFR 10 and 12

Recommended Corrective Action-

(1) Establish and document a standardized process in support of coordinating renewals of medical examinations for all personnel. At a minimum, the process should provide for effective tracking of expiration dates, notification of personnel of pending expiration dates and verification of all renewal records. Further, MSFS should establish an effective system to maintain copies of examination records for all personnel. The sensitivity of such records is appreciated, and it is recommended that a signed "fit for duty statement" or equivalent from a licensed physician be accepted to satisfy this item.

(2) It is suggested that MSFS consider whether an increased frequency for medical examinations be adopted in the interest of proactively monitoring the physical fitness of its personnel. It is suggested that annual medical examinations be considered for MSFS Captains.

2.1.5 Training Programs

Summary-

MSFS has not adequately defined or supported training programs for its personnel.

Discussion-

(a) Personnel interviewed were not able to describe any training programs supported by MSFS. Training appears to be self-directed for those individuals who may seek to enhance their professional competence. MSFS does not require participation in the types of training that

have become fairly common within the industry such as STCW Basic Safety Training (see the previous section 2.1.3 (b), STCW Bridge Resource Management, etc.

(b) Drills are considered by SMSLLC to be a valuable component of training programs, and it was observed that MSFS has supported this area to an extent. Drills are normally completed by crews weekly on Sunday, though not in accordance with a plan to ensure that throughout the year ample training is afforded in sufficient areas. For example, MSFS has not specified "required" drills and the periodicity for performing them. Weekly fire drills appear to be completed by all crews, though it is not clear if equipment is sufficiently tested and broken out to promote familiarity with operation (e.g., hoses, nozzles, etc.). It was determined that additional drills including abandon ship, collision, grounding, loss of propulsion, emergency steering, crow control, etc. are not sufficiently considered by the organization.

(c) The process by which personnel are familiarized with each ferry and their respective duties following their hire was discussed with several employees. Such training is supported by on the job training and is not documented. It was related that familiarization is not always provided when a new crewmember is shifted to a different vessel or a backup ferry is put into service.

Reference-

- 33 CFR 96 Table 96.250 (f) (h)
- 46 CFR 78.17-50, 122.420 and122.520/524

Recommended Corrective Action-

(1) Establish and document a process in support of how MSFS will identify training needs and support their implementation as training programs. It is suggested that the result of this process is the maintenance of a "training plan" that clearly defines required training for each position within the organization.

(2) Establish and document a process in support of emergency preparedness and drills. Procedures should be developed to specifically address a range of situations including fire, grounding, collision, man overboard, crowd control, steering failure, black out, evacuation, oil spill, serious injury and any other potential emergencies deemed credible by MSFS. Procedures for drills should clearly establish requirements with respect to the types of drills and periodicity for performing them. In addition, guidance should be provided with respect to appropriate scenarios to benefit the training aspect for each drill. It is additionally recommended that MSFS consider including community first responders in drills at appropriate intervals to provide essential training in coordinating the response to an emergency situation (e.g., fire alongside pier, medical evacuation from a machinery space, etc.).

(3) Establish and document a process in support of familiarization training for newly hired personnel. It is suggested that the process incorporate the use of checklists to ensure that relevant training topics and particular arrangements for each MSFS ferry are reviewed with each trainee prior to assigning such personnel to serve as a crewmember onboard.

2.2 Management and Administration

2.2.1 Policy

Summary-

MSFS does not effectively communicate its essential policies throughout its workforce. Existing arrangements are confused on a number of levels and appear to have not been updated since July 2000.

Discussion-

(a) SMSLLC obtained a complete copy of MSFS policies as most recently updated (July 1, 2000). Policies are arranged in individual "series" assigned to specific classes of workers (e.g., series 100 applies to "all ferry service employees", while series 300 applies to "all ferry service captains"). On review of the documents it was determined that many essential requirements are communicated, though the presentation is fragmented and inadequate. It is difficult for the end-user to readily access relevant information.

(b) MSFS has not established an appropriate mission or policy statement regarding its operations and intended goals. It is typical within the industry for vessel operators to communicate their objectives to ensure safety and pollution prevention while supporting their transportation mission. Such a policy statement is required under the referenced regulations.

(c) It is also established industry practice to provide for a more effective method to support and organization's communication of its requirements to its personnel. A more effective approach for MSFS may be to arrange its requirements within an appropriately designed "operations manual" or the like to better communicate its established policies, processes and procedures.

Reference-

- 33 CFR 96 Table 96.250 (a) and (k)

Recommended Corrective Action-

(1) Review all currently issued MSFS policies for continued validity to the organization. Remove any obsolete documents from distribution.

(2) Establish and document a suitable documentation outline (e.g., Operations Manual) for presenting MSFS requirements including policies, processes and procedures. Information should be grouped and arranged according to topical areas (e.g., Terminal Operations, Deck Operations, Engineering Operations, etc.) to benefit the end-user.

(3) Establish and document a document control process. Responsibilities for the development, approval and distribution (control) of documented requirements should be clearly defined within the organization. MSFS should determine how requirements will be introduced throughout its organization as documentation is released and revised over time. Arrangements in support of the periodic review of all documented requirements should be clearly defined. Ensure that consistent templates are developed for communicating MSFS requirements.

(4) Establish and document an appropriate mission statement or policy regarding safety and pollution prevention. It is recommended that the signature of top management be applied to this document.

2.2.2 Regulatory and Industry Developments

Summary-

While MSFS clearly succeeds in its compliance with U.S. Coast Guard regulations, it does not have a sufficient mechanism to monitor regulatory developments or emerging industry best practices and standards to benefit its own operations.

Discussion-

(a) In addition to providing evidence of consistently favorable U.S. Coast Guard inspection results, MSFS has demonstrated compliance in areas that are not as effectively verified by the regulator including adherence to limitations on working hours, implementation of random drug testing and completion of drills on a weekly basis.

(b) An individual has not been tasked within the organization to monitor appropriate resources for pertinent information that may impact MSFS or provide guidance regarding potential improvements. Personnel were generally aware of pertinent regulations, though no particular individual is accountable to maintain conversance with regulatory and industry developments.

(c) Similarly, it did not appear through interviews that MSFS personnel were provided with suitable opportunities to review pertinent "lessons learned" as communicated within the marine industry. The discussion of such items has become standard within the industry to enhance organizational knowledge and bolster accident prevention efforts.

Reference-

- 33 CFR 96 Table 96.250 (f)

Recommended Corrective Action-

(1) Establish and document a process in support of monitoring, reviewing and communicating appropriate regulatory and industry information throughout the organization. The process should specify the resources to be monitored and it is recommended that the organization maintain a suitable "reference library" in a location that is accessible to all personnel.

(2) Establish and document a process in support of safety meetings and review of appropriate "lessons learned" following industry analysis of accidents, near-misses, etc. Note that such meetings could be used to support other communications including the introduction of new or changed requirements within the organization (see the previous item 2.2.1 (3). Meetings should include a combination of vessel and shore-based personnel whenever possible to benefit the exchange of information from both operational perspectives.

2.2.3 Corrective Action

Summary-

MSFS does not have a formalized mechanism to review and investigate unplanned and unwanted events so that appropriate and effective corrective action may be identified and implemented.

Discussion-

(a) MSFS uses State of Maine reporting forms following personal injuries for both passengers and crewmembers. In addition, personnel perform reporting to the U.S. Coast Guard as required by regulation and recorded on form CG-2692 as necessary. All injuries and accidents are reported to the State of Maine, Office of Risk Management, and recorded in vessel logbooks.

(b) Feedback is not received from the State of Maine regarding reported items to assist MSFS with its analysis of basic causes.

(c) There is no formalized corrective action process. Most exchanges are verbal and information spreads by word of mouth through the fleet. Vessel personnel related that most interaction in this regard is coordinated by telephone or stopping by shore-based personnel offices. Very little is typically recorded.

(d) Events that are not constituted as "reportable" to the State of Maine or U.S. Coast Guard (e.g., lesser injuries, equipment damage or near-miss situations) are not generally reported within MSFS or to other entities. An exception to this was observed by SMSLLC as a photographic "report" of safety concerns for the Swans Island Terminal dated 2-August-04. The damages recorded in the photograph and reported within the accompanying text by a MSFS Captain were observed by SMSLLC to remain more than two years after the initial reporting date (see also the following section 2.4.1 for more details on this and related terminal maintenance issues). It is unclear to SMSLLC how this particular item was processed beyond initial reporting to the MSFS Manager.

(e) Irrespective as to whether an incident is reported or not, MSFS does not follow a systematic approach to review basic causes and identify and implement appropriate corrective action.

Reference-

- 33 CFR 96 Table 96.250 (i)
- 46 CFR 4.05

Recommended Corrective Action-

(1) Establish and document a process to define the requirements for reporting and analysis of nonconformities (i.e., events that do not conform with specified MSFS or regulatory requirements), accidents (i.e., personal injuries or equipment damages), and near-miss situations.

(2) The process should ensure that the State of Maine, Office of Risk Management provides timely feedback to MSFS regarding all reported items.

(3) The process should provide for a method for MSFS to track its progress towards implementing corrective action for all nonconformities, accidents and near-miss situations experienced within its operations – irrespective as to whether and item has been reported to external parties. To the extent practicable, corrective action should be implemented in as timely a manner as possible.

(4) The process should additionally establish requirements for MSFS to verify the effectiveness of corrective action following implementation to determine if arrangements are suitable and effective as long-term solutions.

2.2.4 Verification, Review and Evaluation

Summary-

MSFS has not supported verification activities to determine whether its policies and requirements are actually implemented. In addition, a system has not been established to coordinate a review of existing requirements to plan for future improvements.

Discussion-

(a) Shore-based personnel (e.g., Port Captain and Port Engineer) reportedly do not routinely ride each ferry. The Port Captain is occasionally required to substitute as Captain or to perform onboard duties as Company Security Officer. The Port Engineer typically attends a ferry when requested and in preparation for shipyard periods. When attending the vessel, neither the Port Captain nor the Port Engineer specifically verifies vessel conformance with MSFS requirements (e.g., documented policies, etc.).

(b) Regulations address the requirement to perform audits to periodically verify, review and evaluate implementation of policies and procedures. Industry practice has evolved such that audits, which constitute a verification method, are performed on various levels at frequent intervals. For example, it is common for a Port Engineer and Port Captain to attend vessels at least annually for the purposes of verifying implementation of requirements and performing a physical inspection of the vessel and its equipment. In addition, it is common for a party independent of operations and engineering to conduct a "management system internal audit" both onboard each vessel and within shore-based locations to verify implementation of all stated requirements. Through review of existing arrangements, MSFS personnel informally support a degree of verification through involvement of shore-based personnel with each ferry, though it is not in accordance with a specific process.

(c) Regulations additionally address the requirement for top management (shore-based and onboard each vessel) to objectively review the success of specified requirements in achieving the goals and objectives of the organization. Naturally, personnel including the MSFS Manager discuss such items on a frequent basis, though again as with the previous item, such is not coordinated systematically in accordance with a specific process.

Reference-

- 33 CFR 96 Table 96.250 (l)

Recommended Corrective Action-

(1) Establish and document processes in support of the following verification, review and evaluation functions including:

   a. Periodic verification activities of key onboard vessel operations and maintenance activities. It is suggested that this verification be performed by the Port Captain and Port Engineer at least twice annually for each MSFS ferry.

   b. Periodic verification activities of all MSFS stated requirements. It is suggested that this verification be performed by a party independent from shore-based operations and engineering functions annually.

   c. Periodic review by top shore-based and vessel management of the results of verification activities to identify potential areas for improvement.

(2) The processes should be based upon related International Organization for Standardization (ISO) standards and clearly establish the arrangements for communicating results and implementing corrective action for any deficiencies observed as a result of verification, review and evaluation activities.

(3) Sufficiently detailed checklists should be developed and maintained in support of verification procedures to ensure thoroughness and objectivity.

2.2.5 Designated Person

Summary-

The MSFS shore-based organization is smaller in comparison to other ferry operations with a similar fleet size. While personnel assume numerous collateral duties, no one has been specifically tasked to serve as the Designated Person[7].

Discussion-

(a) The Port Captain is generally assigned to oversee vessel safety-related issues. However, no one has been tasked to support a more robust safety and pollution prevention oversight role as specified by regulations.

(b) It would be acceptable though challenging to assign this Designated Person role as a collateral duty to an existing MSFS position. It would be preferable for this position to be supported by an individual who is not accountable for additional operational, engineering or management duties.

Reference-

- 33 CFR 96 Table 96.250 (c)

Recommended Corrective Action-

(1) As related in the previous item 2.1.2 (1) duties and responsibilities for a Designated Person should be clearly documented.

(2) It is strongly suggested that Maine DOT consider an allocation within the MSFS organization for this critical position. It is suggested that in addition to responsibilities relating to "monitoring", that the Designated Person be assigned duties to effectively coordinate many essential tasks including, for example:

a. Coordination of documentation development, review and distribution;

b. Coordination of safety meetings and sharing lessons learned throughout the fleet; and

c. Coordination of verification, review and evaluation activities.

[7] The role of this individual as stated within regulation is to "monitor the safety management system for the company and vessel". The individual should be positioned to have direct access to communicate with the highest levels of management within the organization and with all management levels ashore and onboard the organization's vessels. In addition, the Designated Person is required to have the written responsibility to ensure that there are "adequate support and shore-based resources for vessel operations".

2.3 Navigation, Cargo and Deck Operations

2.3.1 Loading and Discharging

Summary-

While cargo operations were observed to be well coordinated, MSFS has not established written passenger and vehicle loading and discharging procedures.

Discussion-

(a) Coordination of loading and discharging was generally well coordinated by ferry crewmembers. Communications between pilothouse and personnel on the vehicle deck were effective. Vehicle lashings were properly applied when directed by the Captain.

(b) Personnel were observed to take passenger and vehicle counts. However, it was observed that in contravention to regulations, passenger count information is not related ashore upon ferry departure. Note that 46 CFR 122.504 "Passenger Count" applies only to the *Margaret Chase Smith*. However, it is the opinion of SMSLLC that this should be facilitated for all vessels given industry experience in this area.

(c) While it was related by MSFS personnel that vehicles are loaded prior to passengers, SMSLLC did observe passengers being allowed to board simultaneously with vehicles. At no time was passenger safety compromised, though it is conceivable that under certain conditions this practice may result in an accident. Note that SMSLLC did not observe the simultaneous disembarking of passengers and vehicles. Passengers were consistently held onboard until vehicle discharging had been completed.

Reference-

- 33 CFR 96 Table 96.250 (g)
- 46 CFR 78.40,122.340 and 122.504

Recommended Corrective Action-

(1) Establish and document procedures in support of passenger and vehicle loading and discharging operations. Procedures should clearly establish requirements that are to be consistently practiced onboard each ferry.

2.3.2 Start-Up and Shutdown

Summary-

A systematic check of essential vessel systems and equipment was not observed during the daily start-up of ferries attended. Likewise, a systematic confirmation of the proper securing of such systems during daily shutdown was not witnessed by SMSLLC.

Discussion-

(a) A formalized approach to testing and inspecting essential vessel systems as required by regulations and guided by industry practices has not been established. Industry practice has evolved such that vessel operators typically provide each vessel with suitable start-up and shutdown checklists that indicate tests and inspections required prior to putting a vessel into service. SMSLLC did not observe sufficient checklists or guidance documents onboard

vessels with the exception of some documented start-up guidance for each ferry's Engine Room. The use of this guidance is likely consistent, though Licensed Engineers do not record their completion of start-up in accordance with this guidance in the logbook.

(b) Industry practice in this area typically exceeds regulatory requirements regarding the periodicity for tests and inspection. For example, under 46 CFR 78.17 steering gear, whistle, and means of communications would only require weekly testing for MSFS vessels. However, the majority of vessel operators would test such systems prior to putting a vessel into daily service.

(c) Most Captains were consistent in their start-up procedures and it was noted that certain items are typically not checked including communications to the Engine Room, steering gear operation from the steering gear compartment, engine ahead/astern function test.

(d) ABs observed by SMSLLC did not perform checks of safety equipment (i.e., firefighting and lifesaving equipment), lashing gear, chocks, etc. in accordance with any specific directions. Checks appeared to be haphazard at best in these areas.

(e) Current start-up arrangements do not ensure that there is direct communication between the Pilothouse and Engine Room prior to ferry departure. The Captain does not necessarily have positive confirmation that all machinery and systems are properly operating prior to departure. Licensed Engineers would likely report if a deficiency exists. Nonetheless, direct voice contact between Pilothouse and Engine Room should be supported to confirm that start-up procedures have been completed and the vessel is clear for operation.

(f) Similar to start-up procedures, methods are not standardized to ensure that essential items are not overlooked during vessel shutdown.

Reference-

- 33 CFR 96 Table 96.250 (g) and 33 CFR 164.25
- 46 CFR 78.17 and 122.320

Recommended Corrective Action-

(1) Establish and document procedures in support of ferry start-up and shutdown operations. Procedures should clearly establish requirements that are to be consistently practiced onboard each ferry. Tasks should be clearly assigned for each position involved during these operations. It is suggested that vessel-specific checklists be developed to guide personnel in the performance of specified tasks.

(2) Ensure that procedural arrangements clearly identify record-keeping requirements. It is recommended that Deck and Engine logbook entries be specified to record completion of start-up and shutdown in accordance with specified checklists.

2.3.3 Passenger Safety

Summary-

Basic passenger safety measures including vessel departure safety orientations and frequent rounds by crewmembers of passenger accommodation areas were not observed during the assessment.

Discussion-

(a) Passenger safety orientation announcements were not made onboard any vessel attended. Note that 46 CFR 122.506 "Passenger Safety Orientation" applies only to the *Margaret Chase Smith*. However, it is industry practice for such announcements to be provided onboard all passenger vessels – not only ferries.

(b) Crewmembers suggested that passenger safety orientations would only serve to offend and insult MSFS' frequent ridership. SMSLLC disagrees with this sentiment and notes that in its experience, MSFS is the only passenger vessel operator it has observed that does not make such announcements.

(c) While regulations do not specifically require MSFS crewmembers to perform periodic rounds of passenger accommodation spaces while a ferry is underway, it is industry practice to perform such rounds frequently in the interest of vessel and passenger safety. Rounds were observed to be conducted infrequently onboard vessels attended. ABs were observed to spend nearly the entire trip in the Pilothouse. As with the previous item, SMSLLC has not encountered a passenger vessel operator that does require the performance of frequent rounds in such spaces.

Reference-

- 33 CFR 96 Table 96.250 (g)
- 46 CFR 122.506

Recommended Corrective Action-

(1) Establish and document procedures in support of passenger safety that specify requirements regarding safety orientations and periodic rounds of passenger accommodation spaces. Procedures should clearly establish requirements that are to be consistently practiced onboard each ferry.

(2) Procedures should specify the periodicity for rounds and it is suggested that ABs rotate to ensure that a full round is performed at least every 20 minutes during each voyage.

(3) It is suggested that MSFS consider the installation of passenger safety orientation recordings onboard each of its vessels.

2.3.4 Navigation Information

Summary-

Navigation information as provided by paper and electronic charts was observed to be outdated or of suspect currency onboard several vessels.

Discussion-

(a) U.S. Coast Guard *Local Notice to Mariners* (LNM) are provided weekly by the Port Captain for each ferry. It was observed that chart and publication corrections from LNM are not necessarily completed weekly onboard each vessel. It was related during interviews that such may take up to a month depending on circumstances.

(b) Electronic Chart Systems (ECS) have been installed onboard all ferries with the exception of the *Margaret Chase Smith*. It was observed onboard each vessel that the operator's manual

was not available. SMSLLC could not determine whether electronic charts have ever been updated since ECD installation. Personnel interviewed were not aware of a subscription to receive such updates on a periodic basis. Note that ECS is not approved by the U.S. Coast Guard as a substitute for paper charts – therefore the ECS is viewed as an "information only" aid to navigation. Nonetheless, SMSLLC strongly believes that such a system should be provided with timely chart corrections as referencing erroneous chart data may be contributory to an accident.

(c) Regulations specify the duties of officers for the maintenance of aids to navigation maintained onboard. MSFS has demonstrated that it maintains such information within each vessel's pilothouse as suggested by the regulation. MSFS is not capable of demonstrating that all of its vessel charts and publications are up-to-date. In practical terms this should be supported on at a weekly basis.

(d) Note that 46 CFR 78.05 "Notice to Mariners and Aids to Navigation" does not apply to the *Margaret Chase Smith*. However, it is strongly recommended that such requirements be adopted fleet-wide.

Reference-

- 33 CFR 96 Table 96.250 (g)
- 46 CFR 78.05

Recommended Corrective Action-

(1) Establish and document procedures in support of processing corrections to aids to navigation including charts (paper and electronic) and publications. Ensure that such procedures clearly specify required inventories or "libraries" as well as the timeline for processing corrections.

(2) Subscribe each ferry to an appropriate service to receive periodic updates for ECS charts. Arrangements for maintaining this subscription should be detailed within the related procedures.

2.3.5 Navigation Systems

Summary-

Certain systems may be providing information that is slightly in error and may compromise safe navigation.

Discussion-

(a) Each vessel attended has not determined the deviation of its magnetic compass since 1998. It is industry practice for deviation to be determined, recorded and posted in the Pilothouse by an appropriately qualified contractor on an annual basis.

(b) Navigation system installations are established for existing vessels. Captains interviewed related some concerns regarding satellite compass units insofar as the time lag (up to 30 seconds) to adjust to a course change. Not all vessels were observed to have gyrocompasses. Each vessel did have an Automatic Radar Plotting Aid (ARPA) to assist with collision avoidance, though those vessels without a gyrocompass use the satellite

compass as a data feed for the ARPA. Given the time lag of the satellite compass and the need for real-time data from the ARPA, this arrangement is not ideal.

Reference-

- None

Recommended Corrective Action-

(1) Determine magnetic compass deviation for each ferry and post such information within a prominent pilothouse location.

(2) Establish and document procedures in support of maintaining navigation systems including the annual determination of magnetic compass deviation.

(3) For future vessels, ensure the navigation system installation includes a gyrocompass.

2.3.6 Grounding Hazards

Summary-

Groundings and the resultant pollution from fuel oil spilling from a ruptured hull comprise a significant percentage of vessel incidents throughout the industry. The nature of MSFS operating areas places the operation at a relatively higher risk regarding such an incident involving one of its ferries.

Discussion-

(a) MSFS Captains are skilled operators who appreciate the grounding and other hazards of their respective routes. It was related by Captains that Vinalhaven, Frenchboro and Matinicus runs all have known grounding hazards.

(b) Operating in certain areas such as Matinicus is exclusively dependant upon tidal conditions and there is a limited margin for error.

(c) MSFS has not established specifications regarding mandatory under keel clearance (UKC) to be maintained at all times for each ferry. The specification of UKC has become widely adopted within the tanker industry and is gaining in adoption within other industry sectors.

Reference-

- 33 CFR 96 Table 96.250 (g)

Recommended Corrective Action-

(1) Establish and document clear guidelines regarding minimum UKC that take appropriate factors into account.

2.3.7 Watchstanding

Summary-

MSFS Captains and ABs are well aware of their duties, though MSFS has not sufficiently established its watchstanding expectations to cover a wide range of operational scenarios (e.g., vessel underway, alongside, emergency situations, etc.).

Discussion-

(a) MSFS has only minimally documented its expectations for vessel watchstanders. U.S. Coast Guard guidance as well as industry standards have not been considered in establishing clear requirements.

(b) While a specific regulatory requirement regarding this area does not exist, it is established industry practice to standardize an organization's expectations for its vessel watchstanding personnel through documented "standing orders" that are supported by appropriate procedures and instructions. For Captains and ABs such orders would normally address a comprehensive range of vessel operational conditions.

(c) It is also common within the industry to require personnel to periodically review documented expectations and to sign an "acknowledgement of understanding" record. This type of mechanism was not observed in support of existing MSFS documented requirements.

(d) It is not uncommon within industry for Captains to supplement company expectations with their own written standing orders and instructions. SMSLLC recognizes that MSFS crews are small in number and that such supplemental instructions may best be communicated verbally. Written orders and instructions from Captains were not observed onboard any vessels.

Reference-

- 33 CFR 96 Table 96.250 (g)
- 46 CFR 78 and Subchapter K Subparts B, C, D, E and G

Recommended Corrective Action-

(1) Establish and document "standing orders" for Captains and ABs that clearly communicate MSFS expectations of their actions during routine operations and emergency situations. Orders should require that the Captain contact the Port Captain or appropriate shore-based management in any situations involving doubt or the need for assistance.

(2) Establish and document a correlating procedure to define how standing orders will be put into practice, periodically reviewed and formally acknowledged in writing by each Captain and AB on a periodic basis.

2.4 Engineering and Maintenance Operations

2.4.1 Terminal Maintenance

Summary-

Several terminals attended by SMSLLC exhibited damage within pens that has reportedly been unattended to for some time and that contributes to undue vessel wear and tear.

Discussion-

(a) A photograph of the Swans Island terminal dated 2-August-04 was provided to SMSLLC during the assessment. Damages recorded in the photograph were observed by SMSLLC to remain more than two years later.

(b) Similar damages (e.g., broken timbers, missing fenders, etc.) were observed by SMSLLC at the Lincolnville and Vinalhaven terminals. The missing fenders results in steel-on-steel contact between the ferry and terminal in the area nearest to the transfer bridges.

(c) It was reported that repairs to terminals are supported by a separate division within Maine DOT and that resources to effect repairs are scarce.

(d) The ferry to terminal interface is a critical one and it accounts for the majority of hull wear during normal operations. As the condition of the interface is compromised due to ineffective maintenance of the terminal, the vessel suffers in kind.

(e) It was reported that the Maine DOT Bureau of Maintenance and Operations is accountable to maintain ferry terminals including transfer bridge systems and structural pilings and timbers.

Reference-

- None.

Recommended Corrective Action-

(1) Coordinate structural surveys for the Swans Island terminal and any other facilities for which structural condition may be compromised. Initiate repairs for these facilities at the earliest opportunity.

(2) It is recommended that Maine DOT coordinate a review of the process by which maintenance of ferry terminals is supported by its Bureau of Maintenance and Operations. It is suggested that additional resources be allocated if necessary to complete needed repairs to frequently used facilities.

2.4.2 Ferry Maintenance

Summary-

Most ferries attended had a basic planned maintenance schedule posted in the Engine Room, though records to confirm the completion of such maintenance were not consistently observed.

Discussion-

(a) Most Engine Rooms have a posted whiteboard that specifies a basic onboard planned maintenance schedule (e.g., mostly limited to changing oil and filters). It was noted that

status details were not recorded on all boards and that other supporting records (e.g., logbook entries) were not available.

(b) MSFS vessel personnel are primarily operators and watchstanders when working. Due to the nature of the ferry runs, there is little time available to perform planned maintenance beyond the aforementioned items.

(c) Notwithstanding, regulations require that planned maintenance arrangements are sufficiently structured to ensure that the following are integrated into the operational routine for each vessel:

i. Inspections are performed at appropriate intervals of vessel's equipment, hull and machinery;

ii. Machinery failures or breakdowns are reported with their possible causes, if known;

iii. Appropriate corrective actions are taken and suitable records are maintained for each failure or breakdown;

iv. Equipment and technical systems are identified for which sudden operational failure may result in a hazardous situation; and

v. Measures are identified to promote the reliability of such equipment and systems.

Reference-

- 33 CFR 96 Table 96.250 (j).

Recommended Corrective Action-

(1) Establish and document a process in support of planned maintenance arrangements to ensure that items within the previous item (c) are fully incorporated.

(2) Planned maintenance arrangements should establish details regarding maintenance tasks supported by MSFS personnel as well as those supported by contractors.

2.4.3 Oil Transfer

Summary-

Suitable precautions were not observed prior to and during fuel and lube oil transfer operations as witnessed for one vessel.

Discussion-

(a) The Licensed Engineer does not sound tanks prior to the transfer. Vessel personnel stated that they know what the fuel truck carries and they take it all until done.

(b) The vessel was not observed to display an appropriate cautionary signal (i.e., Bravo flag) nor was a Declaration of Inspection (DOI) completed prior to the transfer as is customary within the industry.

(c) Spill containment and response equipment was not utilized. For example, boom was not faked on deck as a preventive measure in the vicinity of freeing ports near the fueling station. In addition, it was observed that spill response equipment inventories are minimal with the exception of those sighted onboard the *Margaret Chase Smith*.

(d) Checks of hose connections and tank vents were not supported during transfer operations.

(e) Records of fuel and lube oil transfer are not maintained within a U.S. Coast Guard Oil Record Book as is typical for larger vessels. While the maintenance of this record is not required by regulations for MSFS, it is highly recommended.

Reference-

- 33 CFR 96 Table 96.250 (g) and 156
- 46 CFR 78.17-75

Recommended Corrective Action-

(1) Establish and document procedures in support of fuel and lube oil transfers that include an accurate diagram or mimic of the fuel system including tanks and valves, specifications for required use of spill prevention and response equipment, completion of a pre-operation checklist or DOI, performance of periodic checks for leakage during the transfer and accurate recording of operations within a U.S. Coast Guard Oil Record Book.

(2) Establish sufficient and consistent oil spill response equipment inventories onboard each vessel. It is suggested that equipment specifications as well as measures to periodically inspect the condition of equipment and verify inventory contents be established within a suitable procedure.

2.4.4 Watchstanding

Summary-

MSFS Licensed Engineers are well aware of their duties, though MSFS has not sufficiently established its watchstanding expectations to cover a wide range of operational scenarios (e.g., vessel underway, alongside, emergency situations, etc.).

Discussion-

(a) MSFS has only minimally documented its expectations for vessel watchstanders. U.S. Coast Guard guidance as well as industry standards have not been considered in establishing clear requirements.

(b) While a specific regulatory requirement regarding this area does not exist, it is established industry practice to standardize an organization's expectations for its vessel watchstanding personnel through documented "standing orders" that are supported by appropriate procedures and instructions. For Engineers such orders would normally focus on maintaining the operation of machinery throughout a range of vessel operational conditions.

(c) It is also common within the industry to require personnel to periodically review documented expectations and to sign an "acknowledgement of understanding" record. This type of mechanism was not observed in support of existing MSFS documented requirements.

Reference-

- 33 CFR 96 Table 96.250 (g)
- 46 CFR 78 and Subchapter K Subparts B, C, D, E and G

Recommended Corrective Action-

(1) Establish and document "standing orders" for Licensed Engineers that clearly communicate MSFS expectations of their actions during routine operations and emergency situations. Orders should require that the Licensed Engineers contact the Port Engineer or appropriate shore-based management in any situations involving doubt or the need for assistance.

(2) Establish and document a correlating procedure to define how standing orders will be put into practice, periodically reviewed and formally acknowledged in writing by each Licensed Engineer on a periodic basis.

(3) It is recommended that this procedure is combined with the related requirement affecting Captains and ABs recorded in the previous item 2.3.7.

2.5 Environmental, Health and Safety (EHS) Programs

2.5.1 Emergency Equipment

Summary-

MSFS are generally well equipped with firefighting and lifesaving equipment installations, though inspection arrangements could be improved and additional lifesaving equipment should be provided onboard.

Discussion-

(a) Regulatory inspections are fully supported for firefighting and lifesaving equipment (i.e., U.S. Coast Guard and authorized vendor inspection) for each vessel. However, arrangements by which MSFS internally accounts for this equipment and supports its periodic inspection could be improved.

(b) Equipment is visually inspected during drills, though only that equipment that is actually used during a drill is reviewed. A logbook entry is provided for such inspections. It is established industry practice for vessels to maintain a written inventory and inspection record that is maintained by the crew. Typically, inspections are coordinated on a weekly and monthly basis for various types of equipment.

(c) While not required by regulation, many ferries now carry an Automated External Defibrillator (AED). AED have saved the lives of both passengers and crewmembers. None of the MSFS vessels were observed to have an AED onboard.

Reference-

- 33 CFR 96 Table 96.250 (h)

Recommended Corrective Action-

(1) Establish and document procedures in support of the inspection of emergency equipment by vessel crewmembers. It is suggested that inspection checklists are developed in support of procedures to guide personnel performing inspections.

(2) It is strongly recommended that MSFS seek to install an AED onboard each of its ferries and within each of its terminals.

2.5.2 Personal Protective Equipment (PPE)

Summary-

Consistent standards to address the mandatory use of PPE have not been established for MSFS.

Discussion-

(a) ABs were observed to consistently wear high visibility vests when working on the vehicle deck. However, such vests were not worn by other crewmembers when they were within this area, nor were they offered to SMSLLC personnel.

(b) SMSLLC observed some inconsistency regarding the use of personal flotation devices (PFDs) as personnel were observed working over the side of the vessel (e.g., climbing off a ferry to assist with tie-up in a terminal).

(c) Generally sufficient PPE was observed regarding hearing protection, eye protection and cold weather exposure clothing. Flashlights were not observed to be in the possession of all crewmembers.

Reference-

- 29 CFR 1910.132
- 33 CFR 96 Table 96.250 (g)
- 46 CFR 199

Recommended Corrective Action-

(1) Establish and document clear requirements regarding mandatory PPE use for standard tasks performed onboard MSFS vessels and within its terminals.

(2) Require all MSFS personnel and contractors to don high visibility vests when vehicle loading or discharging operations are being conducted on the vehicle deck.

(3) Ensure that flashlights are made available onboard each vessel for all crewmembers.

3 Recommended Action Plan

The following sections propose an effective strategy to collectively address individual assessment recommendations.

It is strongly suggested that MSFS establish an action plan that specifies achievable timelines and assigns duties and responsibilities to accomplish each task. Timelines should be developed to ensure that a best effort is made to address items in accordance with the priority intervals detailed in the following Figure 3.

Figure 3 – Recommendation Priorities

	High Priority	Medium Priority	Normal Priority
Means-	Recommendation pertains to issues posing a significant compromise to operational integrity, safety or pollution prevention.	Recommendation pertains to essential issues which, if left unresolved, may produce a negative outcome.	Recommendation pertains to issues that would achieve a desirable, though not immediately essential, improvement.
Timeline-	As soon as possible – recommend corrective action to commence within 60 days.	Recommend corrective action to commence within 90 days.	Recommend corrective action to commence within 120 days.

The MSFS Manager should be provided with the necessary resources to support implementation of this recommended plan. In addition, it will be essential for the Manager to have an effective and sustained involvement with and commitment from upper management within Maine DOT.

Recommendations from the previous sections have been assigned priority levels and grouped into collective "recommended actions" as detailed on the following pages.

Recommended actions have been developed in the interest of combining similar tasks within a singular reference to simplify coordination of related activities.

Note that for a number of recommendations, guidance is provided regarding the development of documented policies, processes and/or procedures. Appendix E – *Safety Management System Overview* has been provided to assist Maine DOT in its understanding of how documented policies, processes and procedures should be established within a cohesive *system* of control. It is strongly suggested that MSFS implement a safety management system (SMS) as a means to support the continuity of corrective action for recommendations within this report.

Further, Maine DOT must recognize that implementation of the following recommendations may only be sustained over time provided that it is willing and committed to ensure that sufficient resources are routinely allocated and provided to MSFS.

The commitment of Maine DOT and MSFS personnel will be essential for the success of any action plan to address recommendations within this report.

3.1 High Priority Recommendations

No.	Recommended Action	Guidance	Collective Recommendations Reference
1.	Develop and implement a standardized process in support of verification, review and evaluation of ferry and terminal operations.	*The process should call for more frequent onboard observations supported by shore-based management.*	2.2.4 (1) (2)
2.	Develop and implement procedures in support of passenger safety that specify requirements regarding safety orientations and periodic rounds of passenger accommodation spaces.	*It is suggested that passenger safety orientations be supported by standardized recorded announcements.*	2.3.3 (1) (2) (3)
3.	Subscribe each ferry to an appropriate service to receive periodic updates for existing Electronic Chart System (ECS) units.	*Contact the equipment manufacturer for guidance in this area.*	2.3.4 (2)
4.	Coordinate structural surveys for the Swans Island terminal and any other facilities for which structural condition may be compromised. Initiate repairs for these facilities at the earliest opportunity.	*SMSLLC observed similar damages for Lincolnville and Vinalhaven – though MSFS may have more collective knowledge in this area.*	2.4.1 (1)
5.	Develop and implement procedures in support of fuel and lube oil transfer operations that are consistent with industry practice.	*Provide consistent oil spill response equipment inventories onboard each vessel at the earliest opportunity.* *Equipment specifications (e.g., type and quantities) as well as measures to periodically inspect the condition of equipment and verify inventory contents should be established within a suitable procedure.*	2.4.3 (1) (2) *High Priority continued »*

3.1 High Priority Recommendations

No.	Recommended Action	Guidance	Collective Recommendations Reference
6.	It is strongly recommended that MSFS seek to install an AED onboard each of its ferries and within each of its terminals.	*While not required by regulation, many ferries now carry an Automated External Defibrillator (AED). AED have saved the lives of both passengers and crewmembers.*	2.5.1 (2)

3.2 Medium Priority Recommendations

No.	Recommended Action	Guidance	Collective Recommendations Reference
1.	Develop and implement a standardized process in support of coordinating renewals of medical examinations for all personnel.	*Consider whether an increased frequency for medical examinations be adopted in the interest of proactively monitoring the physical fitness of personnel. It is suggested that annual medical examinations be considered for MSFS Captains given their pilotage responsibilities.*	2.1.4 (1) (2)
2.	Develop and implement standardized processes in support of the performance of emergency drills and coordination of familiarization training for newly hired personnel.	*Both areas support essential training that should be consistently supported by MSFS.*	2.1.5 (2) (3)
3.	Design, develop and implement a suitable and effective structure for documenting and communicating key MSFS requirements. Establish and document an appropriate mission statement or policy regarding safety and pollution prevention.	*Review existing documents for continued validity and inclusion within an appropriately organized MSFS "operations manual".*	2.2.1 (1) (2) (3) (4)
4.	Develop and implement a standardized process to define the requirements for reporting and analysis of nonconformities (i.e., events that do not conform with specified MSFS or regulatory requirements), accidents (i.e., personal injuries or equipment damages), and near-miss situations.	The process should provide for a method for MSFS to track its progress towards implementing corrective action – irrespective as to whether and item has been reported to external parties. The process should ensure that the State of Maine, Office of Risk Management provides timely feedback.	2.2.3 (1) (2) (3) (4) *Medium Priority continued »*

3.2 Medium Priority Recommendations

No.	Recommended Action	Guidance	Collective Recommendations Reference
5.	Maine DOT should consider an allocation within the MSFS organization support the critical position of "Designated Person".	*The Designated Person should be assigned duties to effectively coordinate many essential tasks including, for example:* ❖ *Coordination of documentation development, review and distribution;* ❖ *Coordination of safety meetings and sharing lessons learned throughout the fleet; and* ❖ *Coordination of verification, review and evaluation activities.*	2.2.5 (1) (2)
6.	Develop and implement standardized procedures in support of vessel start-up and shutdown operations.	*It is suggested that vessel-specific checklists be developed to guide personnel in the performance of specified tasks.*	2.3.2 (1) (2)
7.	Determine magnetic compass deviation for each ferry and develop and implement standardized procedures in support of maintaining navigation systems and equipment.	*It is suggested that MSFS contract a suitable party to perform the deviation check on an annual basis.*	2.3.5 (1) (2)
8.	Maine DOT should coordinate a review of the process by which maintenance of ferry terminals is supported by its Bureau of Maintenance and Operations.	*It is suggested that additional resources be allocated if necessary to complete needed repairs to frequently used facilities.*	2.4.1 (2)
9.	Develop and implement standardized procedures in support of the inspection of emergency equipment by vessel crewmembers.	*It is suggested that vessel-specific checklists be developed to guide personnel in the performance of specified tasks.*	2.5.1 (1)

Medium Priority continued »

3.2 Medium Priority Recommendations

No.	Recommended Action	Guidance	Collective Recommendations Reference
10.	Develop and implement standardized requirements in support of personal protective equipment (PPE) usage.	-	2.5.2 (1) (2) (3)

3.3 Normal Priority Recommendations

No.	Recommended Action	Guidance	Collective Recommendations Reference
1.	Develop and implement standardized processes in support of vessel crew changes.	*The process should define requirements regarding the type of information to be exchanged as well as the methods for doing so.*	2.1.1 (1)
2.	Establish clearly documented responsibilities for each shore-based and vessel position for tasks relating to the support of operations. For ferry personnel, responsibilities must be established for each position. Responsibilities for "Captain" should clearly indicate that this position has the "overriding authority" to make decisions regarding safety and pollution prevention and the ability to request assistance from MSFS when necessary.	*Responsibilities for "Captain" should clearly indicate that this position has the "overriding authority" to make decisions regarding safety and pollution prevention and the ability to request assistance from MSFS when necessary.*	2.1.2 (1) (2) (3) (4)
3.	Establish documented qualifications for each shore-based and vessel position that indicate the minimum level of U.S. Coast Guard professional credentials, training and experience to perform related duties.	*MSFS should maintain an accurate accounting of the validity of the professional licenses, endorsements and documents for all of its personnel.*	2.1.3 (1) (2)
4.	Develop and implement a standardized process in support of the identification of training needs and provision of training programs. Consider the provision of STCW Basic Safety Training (BST) for all vessel personnel.	*It is suggested that the result of this process is the maintenance of a "training plan" that clearly defines required training for each position within the organization.*	2.1.5 (1) 2.1.3 (3)

Normal Priority continued »

3.3 Normal Priority Recommendations

No.	Recommended Action	Guidance	Collective Recommendations Reference
5.	Develop and implement standardized processes in support of monitoring, reviewing and communicating appropriate regulatory and industry information throughout the organization, and for conducting periodic safety meetings.	*It is recommended that the organization maintain a suitable "reference library" in a location that is accessible to all personnel.*	2.2.2 (1) (2)
6.	Develop and implement procedures in support of passenger and vehicle loading and discharging operations.	*Procedures should clearly establish requirements that are to be consistently practiced onboard each ferry.*	2.3.1 (1)
7.	For future vessels, ensure the navigation system installation includes a gyrocompass.	*Gyrocompass provides more accurate navigation information than satellite compass.*	2.3.5 (3)
8.	Establish and document clear guidelines regarding minimum under keel clearance (UKC) that take appropriate factors into account.	*The specification of UKC has become widely adopted within the tanker industry and is gaining in adoption within other industry sectors.*	2.3.6 (1)
9.	Establish clearly documented watchstanding expectations for all vessel personnel.	*Documented "standing orders" should be supported by appropriate procedures and instructions and require periodic review and acknowledgment by personnel.*	2.3.7 2.4.4
10.	Develop and implement procedures in support of processing corrections to aids to navigation including charts (paper and electronic) and publications.	*Ensure that such procedures clearly specify required inventories or "libraries" as well as arrangements for maintaining electronic correction subscriptions.*	2.3.4 (1) (2)

Normal Priority continued »

3.3 Normal Priority Recommendations

No.	Recommended Action	Guidance	Collective Recommendations Reference
11.	Develop and implement a process in support of planned maintenance arrangements.	*Planned maintenance arrangements should be supported to ensure the following elements are integrated into the operational routine for each vessel:* ❖ *Inspections are performed at appropriate intervals of vessel's equipment, hull and machinery;* ❖ *Machinery failures or breakdowns are reported with their possible causes, if known;* ❖ *Appropriate corrective actions are taken and suitable records are maintained for each failure or breakdown;* ❖ *Equipment and technical systems are identified for which sudden operational failure may result in a hazardous situation; and* ❖ *Measures are identified to promote the reliability of such equipment and systems.*	2.4.2 (1) (2)

Appendix A – Ferryboat Particulars

Particulars	North Haven	Everett Libby	Governor Curtis	Margaret Chase Smith	Captain Henry Lee	Captain Charles Philbrook	Captain Neal Burgess
Official Number	279604	280585	515310	914647	982982	990664	991931
Call Sign	WL8833	WM5322	WY4734	WTM3462	WBF7529	WBR5375	WBU4273
Length	90'	105'	130'	166.5	130'	130'	130'
Beam	28'7"	28'7"	36'	40'	36'	36'	36'
Draft	7'8"	7'8"	10'	9'5"	10'	10'	10'
Year Built	1959	1960	1968	1987	1992	1993	1993
Passenger Capacity	125	175	221	222	221	221	221
Passenger Seating	24	40	58	164	60	60	60
Vehicle Capacity	9	12	17	30	17	17	17
Max Deck Weight (ST)	30	38	108	161	112	112	112
Speed (knots)	10	10'	12	14	12	12	12
Usable Deck Length	75'	96'	116	154'	116'	116'	116'
Max Vertical Clearance	13'	13'	13'	15'	14'	14'	14'
Max Horizontal Clearance	9'	9'	9.5'	10'	10.5'	10.5'	10.5'
Gross Tonnage	143	198	303	99	288	288	288
Net Tonnage	97	134	206	67	86	86	86
USCG Regulations	Subchapter H	Subchapter H	Subchapter H	Subchapter K	Subchapter H	Subchapter H	Subchapter H
Horsepower	364	364	804	1200	804	804	804
Crew Size	4	4	4	5	4	4	4

Maine State Ferry Service
Assessment Checklists

Appendix B - Sample Ferry Assessment Checklist

Vessel: *F/B Governor Curtis* Date: 6 March 2007 Time On: _____

Captain: _____ Time Off: _____

QUESTION	AREA	COMMENTS	SAT	UNSAT
How is a typical weekly relief carried out? Information exchanged? If you relieve for a daily basis on OT is that any different?	AB			
Please explain your normal duties responsibilities while: - In the pen - Underway - Starting up - Shutting down	AB			
What type of maintenance is done onboard? - corrective? - preventive? - records?	AB			
What is the passenger and vehicle loading procedure? Is this documented?	AB			
What is the procedure for positioning the bridge and aprons?	AB			
What are final checks required prior to allowing vehicles/passengers to disembark?	AB			
How is garbage maintained/disposed of?	AB			
Are there any cleaning chemicals onboard? - MSDS	AB			
Are you ever required to wear a work vest?	AB			
Are there bunkering procedures in place	All			
In your opinion what are greatest risks for: - Passengers - Vehicles - Pollution - Safety of Crew - Safety of Vessel	All			
Who is your direct supervisor Is there an organizational chart for MSFS?	All			

Vessel: *F/B Governor Curtis* Date: 6 March 2007 Time On: _____

Captain: _____ Time Off: _____

QUESTION	AREA	COMMENTS	SAT	UNSAT
What type of drills and training occur onboard?	All			
What type of shorebased training is provided?	All			
How often do you carry out drills? - crowd control - emergency steering - grounding - fire - ferry evacuation - damage control - Jettison of vehicles - Black out (emergency lighting) - emergency generator	All			
What types of onboard incidents or accidents are reported? How are they reported? What is reported verbally?	All			
When something is reported is there follow-up either from office or Captain on any changes to be made to prevent the event from happening again?	All			
What current policies and procedures are in force at MSFS? How do you have access to these? How are you made aware of any new policies and/or procedures?	All			
Does management ask for copies of your license and/or MMD?	All			
Is there a process by which management lets you know that any certificates you hold may expire?	All			
What type of certificates/license to you need for your position?	All			
Are you required to provide proof of physical fitness to MSFS on a periodic basis?	All			
What is the procedure to be followed in the event that fuel spilled during bunkering operations?	All			

Vessel: *F/B Governor Curtis* Date: 6 March 2007 Time On: _____

Captain: _____ Time Off: _____

QUESTION	AREA	COMMENTS	SAT	UNSAT
What types of PPE is provided?	All			
When are reflective vests required?	All			
What is procedure if there is a medical emergency onboard?	All			
Can you explain the 12 hour rule to me? - If you make an emergency run at night is there a minimum rest period that is required before your first scheduled trip?	All			
How do you work with the outside Terminal Agents? - How do they know when to load the boat?	All			
If you get a new crewmember/fill in is there a familiarization process? Documented?	Captain			
What rules are you governed by? - What CFR - State	Captain			
How often does: - Manager ride the ferry? - Port Captain ride? - Port Engineer ride?	Captain			
Is there a process by which you keep Management informed as any problems onboard or to make suggestions for improvements to operations?	Captain			
Do you have periodic safety meetings onboard?	Captain			
On relief day how do you are you made aware of any problems or issues with the ferry?	Captain			
What types of entries do you make in the deck log? - Can I see your logbook? - Does a copy go ashore?	Captain			
What type of maintenance is done onboard? - corrective? - preventive? - records?	Captain			

Vessel: *F/B Governor Curtis* Date: 6 March 2007 Time On: _____

Captain: _____ Time Off: _____

QUESTION	AREA	COMMENTS	SAT	UNSAT
Is there a process/procedure for getting a boat in service?	Captain			
Is there a process/procedure for shutting a boat down?	Captain			
How often do you receive LNM? - where are they stored?	Captain			
Can you explain the Electronic Chart Plotter? - last updates to charts? - operators manual onboard?	Captain			
Is there a process for keeping paper charts up to date?	Captain			
How often is the deviation card updated?	Captain			
Do you have a book of certificates onboard?	Captain			
How do you know what is on these trucks? When does something need a Dangerous Cargo Manifest? What is the process for obtaining a Dangerous Cargo Manifest?	Captain			
What process do you use to stay within the requirements of your stability letter? - What are the specifics of your stability letter?	Captain			
Do you ever take/discharge ballast?	Captain			
Is there any MSFS provided guidance on go / no go situations? - When does USCG say you must not go?	Captain			
What types of situations would make you not leave the pen?	Captain			
How is an underway pilothouse watch organized? - MSFS policy on underway watch arrangements?	Captain			
What are the operational responsibilities of the Captain: - When underway? - When in the pen? - When transferring people/vehicles?	Captain			

Vessel: *F/B Governor Curtis* Date: 6 March 2007 Time On: _____

Captain: _____ Time Off: _____

QUESTION	AREA	COMMENTS	SAT	UNSAT
What precautions are necessary when: - Approaching the pen? - Prior to getting underway?	Captain			
What navigational hazards/dangers are along this route? - Any tidal or current issues?	Captain			
How often is lifesaving and firefighting gear inspected? Records? - Do you have a list of all lifesaving equipment onboard? - Is there a list of all firefighting equipment onboard?	Captain			
Does your crew ever change during the course of a day?	Captain			
How do you know if a procedure or policy is valid?	Captain			
What is your involvement with annual (1/4'ly) COI inspections.	Captain			
On relief day how do you are you made aware of any problems or issues with the engineering systems?	Engineer			
What types of entries do you make in the engine log? - Can I see your logbook? - Does a copy go ashore?	Engineer			
What type of maintenance is done onboard? - corrective? - preventive? - records?	Engineer			
Is there a process/procedure for getting a boat in service?	Engineer			
Is there a process/procedure for shutting a boat down?	Engineer			
Do you ever take/discharge ballast?	Engineer			
What precautions are followed prior to starting bunkering operations?	Engineer			
How are lube oils delivered?	Engineer			

Vessel: *F/B Governor Curtis* Date: 6 March 2007 Time On: _____

Captain: _____ Time Off: _____

QUESTION	AREA	COMMENTS	SAT	UNSAT
Are there any engine room chemicals onboard?	Engineer			
What are your duties during a "normal" roundtrip?	Engineer			
What is your involvement with annual (1/4'ly) COI inspections.	Engineer			
What is the total fuel oil capacity onboard? - < 250 bbl (10,500 gal)	Engineer			

Maine State Ferry Service

Terminal Area Observations

Appendix C – Sample Terminal Assessment Checklist

Terminal: Bass Harbor **Date:** 7 March 2007

Ferry: Captain Henry Lee **Time:** _____

Pictures
Condition of Pen
Condition of Ramp
Overall impression of Condition
Vehicle loading areas and Ferry Office

National Transportation Safety Board

Washington, D.C. 20594

Safety Recommendation

Date: March 18, 2005

In reply refer to: M-05-07

Governors of 40 States, Puerto Rico, and U.S. Virgin Islands
(list attached)

The National Transportation Safety Board (Safety Board) is an independent Federal agency charged by Congress with investigating transportation accidents, determining their probable cause, and making recommendations to prevent similar accidents. We are providing the following information to urge you to take action on the safety recommendation in this letter. The Safety Board is vitally interested in this recommendation because it is designed to prevent accidents and save lives.

The recommendation addresses the voluntary implementation of safety management systems by ferry operators in the United States and its territories or commonwealths. The recommendation derives from the Safety Board's investigation of the allision of the Staten Island Ferry *Andrew J. Barberi* with a maintenance pier at St. George, Staten Island, on October 15, 2003, and is consistent with the evidence we found and the analysis we performed.[1]

At the time of the accident, the *Andrew J. Barberi*, owned and operated by the New York City Department of Transportation, was at the end of a regularly scheduled trip from Manhattan to Staten Island, with 15 crewmembers and an estimated 1,500 passengers on board. The assistant captain was at the controls but, for reasons that could not be determined, was unresponsive to cues of the impending allision. Except for one deckhand, the crewmembers also did not recognize that the ferry was in danger. Ten passengers died in the accident and 70 were injured. An eleventh passenger died 2 months later as a result of injuries sustained in the accident. Damages totaled more than $8 million, including repair costs of $6.9 million for the *Andrew J. Barberi* and $1.4 million for the pier.

The Safety Board determined that the probable cause of the accident was the assistant captain's unexplained incapacitation and the failure of the New York City Department of Transportation to implement and oversee safe, effective operating

[1] For further information, see *Allision of Staten Island Ferry* Andrew J. Barberi, *St. George, Staten Island, New York, October 15, 2003*, Marine Accident Report NTSB/MAR-05/01 (Washington, DC: National Transportation Safety Board, 2005). The report will be available on the Safety Board's website <www.ntsb.gov/publictn/M_Acc.htm>.

procedures for its ferries. Contributing to the cause of the accident was the failure of the captain to exercise his command responsibility over the vessel by ensuring the safety of its operations.

In the Safety Board's opinion, the serious safety deficiencies in the Staten Island Ferry operations that led to the accident could have been addressed by an aggressive safety management system. A safety management system is a structured, documented, multiphase plan of operation developed by an organization to identify, minimize, and manage risks associated with its operations. In the marine industry, ship owners and operators are encouraged, or in some cases required, to develop safety management systems to enhance the safe operation of vessels, prevent injury or loss of life, and avoid damage to the environment. Safety management systems allow organizations to resolve safety problems before accidents or injuries occur, rather than simply complying with regulations imposed from outside.

The purpose of a marine safety management system is to create a "culture of safety" by documenting a vessel owner's operational policy, chain of authority, and operational and emergency procedures; specifying the responsibilities of the owner or operator, managers, and masters; and outlining procedures for management review, internal audits, and correction of "nonconformities" (failure to adhere to procedures or regulations). Procedures are compiled in a safety management manual and a copy is kept on board every vessel. A person or persons are designated in writing to monitor the safety management system, and managers conduct regular audits to ensure that employees follow the procedures. Checklists are supplied for critical areas and when deficiencies are noted or when an accident or a nonconformity occurs. Corrective action is taken until the problem is resolved, and the problem is documented from start to finish. External audits are performed by an approved outside organization, usually a marine classification society, contracted by the operating organization. The external auditor reviews the results of the organization's internal audits and all elements of its management system. The auditor questions management and vessel crews about their knowledge of the safety management system, examines safety records, and verifies that procedures are followed.

Safety management systems are mandatory for U.S.-flag vessels on international voyages under Title 33 *Code of Federal Regulations* (CFR) Part 96. The Federal regulations do not apply to U.S. vessels that operate only on domestic waters, including the Staten Island Ferry and most other ferry operations in the country. However, the regulations allow vessel operators to voluntarily meet the standards and have their safety management systems certificated. The Coast Guard provides guidance for voluntary compliance.[2] An equivalent to compliance with the Federal regulations regarding safety

[2] U.S. Coast Guard, *Marine Safety Manual*, vol. II, section E, chapter 3, "Safety Management Systems (SMS)" (revised May 2000) < http://www.uscg.mil/hq/g-m/nmc/pubs/msm/v2/tocech3.pdf>.

management systems has also been established for small passenger vessels for which full accordance would be "too extensive." Vessel operators may apply in writing to participate in the equivalent program. The Coast Guard has prepared guidance documents (booklet and computer disc) for companies to use in developing equivalent safety management systems.

The Coast Guard has concluded from its casualty studies that "in excess of 80 percent of all high consequence marine casualties may be directly or indirectly attributable to the 'human element'" and has stated that "the use of safety management systems by all U.S. commercial vessels would result in significant benefits and [that it] will support the development of such programs."[3] According to the National Ferry Database, ferry systems operate in 40 of the 50 States and some territories.[4] Statistics from the American Public Transportation Association show that ferries operated by 42 transportation agencies carried nearly 58 million passengers in 2002, and that annual ferry ridership exceeds 1 million in five urban areas.[5] The largest ferry system in the United States, in terms of both ridership and vessel size, is the Washington State Ferries, which is owned and operated by the Washington State Department of Transportation. The ferries operate under a comprehensive safety management system that specifies procedures for the entire fleet, for each vessel, and for each route.

A safety management system necessitates a cultural change in an organization, where the safety of operations is the objective behind every action and decision by both those who oversee procedures and those who carry them out. The system leads to standardized and unambiguous procedures for each crewmember, during both routine and emergency operations. Duties and responsibilities are specified for each staff member and for standard and emergency operations. Supervisory and subordinate chains of command are also delineated.

Since the *Andrew J. Barberi* accident, the New York City Department of Transportation has indicated to the Safety Board that it is implementing a safety management system for its ferries and expects to have it certificated by December 2005. The Board is concerned, however, that the absence of safety management systems on ferries operated elsewhere could result in the type of safety-deficient operation found on the Staten Island ferries and put thousands of passengers at risk daily on U.S. waterways.

The Safety Board recognizes that safety management systems are not mandatory for domestic passenger vessels under current Federal regulations. The Board believes, however, that passengers on domestic vessels should enjoy the same high level of safety as required of U.S. oceangoing vessels. The Board hopes that the Governors will take action to protect the traveling public by promoting the voluntary implementation of safety management systems on passenger ferries, and therefore makes the following safety recommendation to you as Governor:

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[3] *Federal Register*, vol. 62, no. 247 (December 24, 1997), pp. 67492 and 67503.

[4] National Ferry Database, U.S. Department of Transportation, Bureau of Transportation Statistics <www.transtats.bts.gov/Tables>.

[5] <www.apta.com/research/stats/ferry/fbagency/cfm>.

Encourage your public ferry operators to voluntarily request application of the Federal requirements at 33 CFR 96 for implementing a safety management system, if they have not already done so. (M-05-07)

As a result of its investigation of the *Andrew J. Barberi* allision, the Safety Board has also issued safety recommendations to the New York City Department of Transportation, the U.S. Coast Guard, the Passenger Vessel Association, and 41 other Governors. The Board would appreciate a response from you within 90 days addressing actions you have taken or intend to take to implement our recommendation. In your response, please refer to M-05-07. If you need additional information, you may call (202) 314-6177.

Chairman ENGLEMAN CONNERS, Vice Chairman ROSENKER, and Members CARMODY, HEALING, and HERSMAN concurred in this recommendation.

[original signed]

By: Ellen Engleman Conners
Chairman

Appendix E – Safety Management System Overview

At its core, a management system is quite simply an organization's method of controlling its operations to produce a desired outcome.

A *safety* management system functions by focusing a group's requirements and resources on influencing operational outcomes through the control of accidental loss. A management system provides and sustains the necessary control to achieve the desired results.

The variety and scope of management systems is continuously evolving in response to regulations, market forces and cultural factors. Specific management system standards have been established relating to environmental performance, service or product quality and a range of other concerns.

Regardless of its intended outcome, each management system shares certain elements that are essential for its success including:

- **Policy statements**

  Policies should establish the commitment of top management to ensure that the organization's management system is properly supported and remains effective for its intended purpose and scope.

- **Defined organization and responsibilities**

  As the management system is ultimately put into action by people, it is essential that the organization that is accountable to implement, manage and verify requirements be defined and adequately supported in the performance of their work. In addition, each position or title within the organization should be provided with clearly defined duties and responsibilities. Authorities and interrelations of personnel should be established by organizational charts.

- **Procedures in support of key operations**

  "Key" operations include those that are essential to the organization in fulfilling its mission. Such procedures should clearly define the requirements and actions necessary to produce the desired outcome.

- **Procedures in support of continual improvement**

  Continual improvement is not merely a goal; it is an expectation of any management system. Various procedures are available within a system including:

  - *Verification including internal audits of process and resources. Audits seek to determine whether specified arrangements are implemented, and moreover to assess whether they are effective and suitable to achieving the planned results.*
  - *Review by top management of the overall effectiveness of the system to plan for appropriate improvements.*
  - *Deficiency reporting in order that problems, including those that nearly resulted in an accidental loss, are accurately reported, reviewed and provided with corrective action.*
  - *Review and reporting mechanisms to ensure an open and effective dialogue regarding the suitability and effectiveness of the management system as supported by periodic meetings or discussions involving managers and field personnel.*

In addition, a *safety management system* should include the following elements:

- **Procedures to prepare for and respond to emergency situations**

  Emergency situations may involve a range of vessel-related incidents (e.g., personal injury, equipment damage or pollution,) and procedures to describe the responses to such occurrences are essential. In addition, it is equally important that a defined program for drills is established to ensure the organization is competent and prepared to respond in the event of an actual emergency situation.

- **Procedures in support of safe working practices**

  "Safe working practices" refer collectively to workplace safety and include many OSHA-related programs such as personal protective equipment (PPE), lock-out / tag-out, safety assessments, etc.

Within the marine industry a variety of management system standards have been adopted including:

- *The International Safety Management (ISM) Code* as established by the International Maritime Organization (IMO) and made mandatory as an international regulations for commercial vessels that operate in international waters since 1998. The U.S. Government is a signatory to this regulation and has created 33 CFR Part 96 *Rules for the Safe Operation of Vessels and Safety Management Systems* to adapt the international regulation for domestic vessels.
- *The American Waterways Operators' Responsible Carrier Program (RCP)* is an industry-initiated program designed as a framework for continuously improving the industry's safety performance. AWO members use the RCP as a guide in developing company-specific safety and environmental programs that are tailored to the unique operational environments found in the barge and towing industry. The program complements and builds upon existing government regulations, requiring company safety standards that exceed those required by federal law or regulation.
- *The Tanker Management and Self Assessment (TMSA) Guidelines* are the first part of a program spear-headed by the Oil Companies' International Maritime Forum (OCIMF) as a best practice guide to tanker operations. Its requirements will become the cornerstone of each oil majors' verification/inspection program. Conformance with these "guidelines" has become mandatory for every organization that intends to carries product for oil majors (e.g., Total, Shell, Mobil, etc.).

The greatest challenge to any organization that puts a management system into place, is sustaining its effectiveness over time. For this, the attitudes, motivation, commitment and competence of personnel at all levels – including top management – are essential.