

**EXAMINATION OF REPORTS ON THE “EL FARO”
MARINE CASUALTY AND COAST GUARD’S ELEC-
TRONIC HEALTH RECORDS**

(115–34)

HEARING
BEFORE THE
SUBCOMMITTEE ON
COAST GUARD AND MARITIME TRANSPORTATION
OF THE
COMMITTEE ON
TRANSPORTATION AND
INFRASTRUCTURE
HOUSE OF REPRESENTATIVES
ONE HUNDRED FIFTEENTH CONGRESS

SECOND SESSION

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²This is an excerpt from the 199-page U.S. Coast Guard Marine Board report entitled, “Steam Ship *El Faro* (O.N. 561732) Sinking and Loss of the Vessel with 33 Persons Missing and Presumed Deceased Northeast of Acklins and Crooked Island, Bahamas, on October 1, 2015” and available online at <https://media.defense.gov/2017/Oct/01/2001820187/-1/-1/0/FINAL%20PDF%20ROI%2024%20SEP%2017.PDF>.

³This is an excerpt from the 282-page National Transportation Safety Board report entitled, “Sinking of U.S. Cargo Vessel *SS El Faro*, Atlantic Ocean, Northeast of Acklins and Crooked Island, Bahamas, October 1, 2015” adopted December 12, 2017, NTSB/MAR-17/01, PB2018-100342 and available online at <https://www.nts.gov/investigations/AccidentReports/Reports/MAR1701.pdf>.



Committee on Transportation and Infrastructure
U.S. House of Representatives
Washington DC 20515

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January 26, 2018

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SUMMARY OF SUBJECT MATTER

TO: Members, Subcommittee on Coast Guard and Maritime Transportation
FROM: Staff, Subcommittee on Coast Guard and Maritime Transportation
RE: Hearing on "Examination of Reports on the El Faro Marine Casualty and Coast Guard's Electronic Health Records System"

PURPOSE

The Subcommittee on Coast Guard and Maritime Transportation will hold a hearing on Tuesday, January 30, 2018, at 10:00 a.m., in 2167 Rayburn House Office Building to examine the fatal sinking of the U.S.-flagged cargo ship SS EL FARO and the Coast Guard's efforts to implement an Electronic Health Record system. The Subcommittee will hear testimony from the United States Coast Guard (Coast Guard or Service), the National Transportation Safety Board (NTSB), and the U.S. Government Accountability Office (GAO).

BACKGROUND

EL FARO Sinking

On October 1, 2015, during Hurricane Joaquin, the 790-foot U.S.-flagged cargo ship SS EL FARO sank in the Atlantic Ocean about 40 nautical miles northeast of Acklins and Crooked Island, Bahamas. The loss of the U.S.-flagged cargo vessel EL FARO, along with its 33-member crew, ranks as one of the worst maritime disasters in U.S. history, and resulted in the highest death toll from a U.S. commercial vessel sinking in almost 40 years (the last comparable U.S. maritime disaster was the sinking of the U.S. bulk carrier MARINE ELECTRIC off the coast of Virginia in February 1983, in which all but three of the 34 persons aboard lost their lives). Both the Coast Guard and the NTSB have determined that the sinking of the EL FARO was a preventable accident.

At the time of the sinking, EL FARO was on a U.S. domestic voyage with a full load of containers and roll-on roll-off cargo bound from Jacksonville, Florida to San Juan, Puerto Rico. As EL FARO departed port on September 29, 2015, a tropical weather system that had formed east of the Bahamas Islands was rapidly intensifying in strength. The storm system evolved into Hurricane Joaquin and, contrary to weather forecasts and standard Atlantic Basin hurricane

tracking models, travelled southwest. As various weather updates were received onboard EL FARO, the master directed the ship southward of the direct course to San Juan which was the normal route. The master's southern deviation ultimately steered EL FARO almost directly towards the strengthening hurricane.

As EL FARO began to encounter heavy seas and winds associated with the outer bands of Hurricane Joaquin, the vessel sustained a prolonged starboard list and began intermittently taking water into the interior of the ship. Shortly after 5:30 a.m. on the morning of October 1, 2015, flooding was identified in one of the vessel's large cargo holds. At the same time, EL FARO engineers were struggling to maintain propulsion as the list and motion of the vessel increased. After making a turn to shift the vessel's list to port, to close an open scuttle, EL FARO lost propulsion and began drifting with its beam toward the hurricane force winds and seas. At approximately 7:00 a.m., without propulsion and with uncontrolled flooding, the master contacted TOTE's designated person ashore and reported that the ship was experiencing some flooding. He said the crew had controlled the ingress of water but the ship was listing 15 degrees and had lost propulsion. The master also signaled distress using EL FARO's satellite distress communication system. After this point, the Coast Guard and TOTE were unable to reestablish communication with the ship. Shortly thereafter, the master gave the order to abandon ship. The vessel, at the time, was near the eye of Hurricane Joaquin, which had strengthened to a Category 3 storm. Rescue assets began search operations, including a U.S. Air National Guard hurricane tracking aircraft flying over the vessel's last known position, but the search was hampered by hurricane force conditions on scene.

After hurricane conditions subsided, the Coast Guard commenced additional search operations with assistance from commercial assets contracted by the vessel's owner. On October 4, 2015, a damaged lifeboat, two damaged life rafts, and deceased crewmember wearing an immersion suit were found. On October 5, 2015, a debris field and oil slick were found, and the Coast Guard determined that EL FARO was lost and declared the event a major marine casualty. The Coast Guard suspended the unsuccessful search for survivors at sundown on October 8, 2015.

On October 6, 2015, NTSB launched a team to lead the federal investigation in cooperation with the Coast Guard, the American Bureau of Shipping (EL FARO's classification society), and TOTE as parties. The U.S. Navy Salvage and Diving Division of the Naval Sea Systems Command was contracted to locate the sunken ship, assist in the sea floor documentation of the wreckage, and recover the voyage data recorder.

On October 31, 2015, a U.S. Navy vessel located the main wreckage of EL FARO at a depth of over 15,000 feet using side-scan sonar. EL FARO's voyage data recorder was successfully recovered from the debris field on August 15, 2016, and it contained 26-hours of bridge audio recordings as well as other critical navigation data that were used by investigators to help determine the circumstances leading up to this tragic incident.

Coast Guard Investigation

The Coast Guard convened a Marine Board of Investigation (MBI) under the authority of chapter 63 of title 46, United States Code, to examine the sinking of the EL FARO. The MBI held three public hearings in Jacksonville, Florida, in February and May 2016, and February 2017. Seventy-six witnesses testified during 30 days of hearings. The MBI designated the following organizations and person as parties-in-interest in the investigation: TOTE Incorporated, as the parent corporation of the vessel's owner and operator; ABS, as the authorized classification society of EL FARO; Herbert Engineering Corporation, as the naval architecture firm for the owner and operator; and Ms. Teresa Davidson, as next of kin for Captain Michael Davidson, the master of EL FARO. Over the course of the investigation, the MBI also relied on visits to EL FARO's sister vessel, EL YUNQUE, to help understand the internal configuration of the vessels and identify operational and maintenance issues that could have impacted both vessels. The MBI released its report in September 2017.

The MBI determined that the following events led to the sinking of EL FARO:

- EL FARO sailed too close to Hurricane Joaquin due to the master relying on outdated weather data, the master and deck officers not efficiently integrating the use of Bridge Resource Management techniques, and the cumulative effects of anxiety, fatigue, and vessel motion from heavy weather on crewmembers.
- EL FARO experienced an initial starboard list and intermittent flooding which were at least partially attributed to a vessel conversion project undertaken on EL FARO in 2005-2006 that increased the vessel's cargo carrying capacity and load line drafts. That conversion was not designated a "major conversion" by the Coast Guard, resulting in a lower standard of review.
- EL FARO experienced a reduction in propulsion due to an inability to maintain lube oil suction for the main propulsion plant due, at least partially, to the vessel's starboard list.
- The master altered course to put the wind on the vessel's starboard side to induce a port list, which was exacerbated by a previous shift of ballast. The port list resulted in a dynamic shifting of cargo and water, and caused the loss of lube oil suction and the subsequent loss of propulsion.
- The loss of propulsion resulted in the vessel drifting and aligning with the trough of the sea, exposing the beam of the vessel to the full force of the sea and wind. Water continued to flow through ventilation openings and degraded watertight fittings. The vessel's crew did not have the knowledge of the vessel to identify the sources of the flooding, and did not have the equipment or training to properly respond to the flooding.
- The uncontrolled flooding led to the sinking of the vessel and the loss of all 33 persons aboard.

As a result of its investigation, the Marine Board of Investigation made 31 safety and four administrative recommendations to address the causes of the EL FARO sinking. In December 2017, the Commandant of the Coast Guard released his Final Action memo

on the Marine Board's recommendation. The Commandant concurred with 29 of 31 safety recommendations and three of four administrative recommendations. Accordingly, the Coast Guard plans to update regulatory and policy guidance, enhance training for Coast Guard and third-party entities that conduct marine safety activities, and take additional steps to make the U.S.-flagged cargo fleet safer.

NTSB Investigation

The NTSB launched an investigation as soon as the sinking of EL FARO was confirmed. The NTSB identified several major safety issues associated with this accident, including:

- The Captain's actions;
- Currency of weather information;
- Bridge team management;
- Company oversight;
- Damage control plans; and
- Survival craft suitability.

The NTSB determined that the probable cause of the sinking of EL FARO and the subsequent loss of life was the master's insufficient action to avoid Hurricane Joaquin, his failure to use the most current weather information, and his late decision to muster the crew. The NTSB determined that there were also several contributing factors, including:

- Ineffective bridge resource management on board EL FARO, which included the master's failure to adequately consider subordinate officers' suggestions;
- Inadequacy of TOTE's voyage oversight and its vessel safety management system;
- Flooding in a cargo hold from an undetected open watertight scuttle and damaged seawater piping and subsequent downflooding through unsecured ventilation closures to the cargo holds;
- Loss of propulsion due to low lube oil pressure to the main engine resulting from a sustained list;
- The lack of an approved damage control plan that would have assisted the crew in recognizing the severity of the vessel's condition and in responding to the emergency; and
- The lack of appropriate survival craft for the conditions.

As a result of its investigation, the NTSB provided numerous recommendations for responsible entities, summarized as follows:

- Twenty-nine recommendations for the U.S. Coast Guard;
- Two recommendations for the Federal Communications Commission;
- One recommendation for the National Oceanic and Atmospheric Administration;

- Nine recommendations for the International Association of Classification Societies;
- One recommendation for the American Bureau of Shipping;
- One recommendation for Furuno Electric Company, Ltd; and
- Ten recommendations for TOTE Services, Inc.

Electronic Health Records

In September 2010, the Coast Guard awarded a five year, \$14 million contract to acquire a commercial off-the-shelf electronic health records (EHR) system to manage data for over 56,000 members, replace outdated systems, and provide interoperability with Department of Defense (DoD) and Department of Veterans Affairs (VA) systems. After awarding the contract, the Coast Guard recognized that other health care-related information technology systems were outdated and also needed modernization. As a result, the Coast Guard expanded the project to become the Integrated Health Information System (IHIS) which included contracts with 25 different vendors with a then-estimated cost of \$56 million to implement.

In January 2015, the Coast Guard's Chief Financial Officer (CFO) identified concerns regarding certain funding and contractual issues with the IHIS project. After conducting a thorough administrative investigation, the CFO determined that those issues did not constitute violations of the Anti-Deficiency Act. In July 2015, the Coast Guard Investigative Service initiated a criminal investigation of the IHIS project. That investigation is expected to be completed later this spring.

In October 2015, at the direction of the Vice Commandant of the Coast Guard, ADM Charles Michel, the Coast Guard cancelled the IHIS project, abandoning the effort to develop the new EHR system. After expending more than \$66 million and wasting over five years, the Coast Guard finds itself in a worse position than before awarding the first contract in 2010. The Coast Guard is handling all medical information using paper records – records that cannot be shared with DoD or VA.

The Coast Guard is currently following the Non-Major Acquisition Process (NMAP) to implement a new EHR system. The Service has conducted research and determined that the recommended solution would be to use an existing federal agency system. However, despite the need for interoperability with DoD and VA systems, the Coast Guard has not yet made a final determination on the system to be used. Successfully and quickly implementing an EHR system will improve the quality and efficiency of care to the thousands of Coast Guard active duty and reserve members that receive health care.

At the request of the Chairman and Ranking Member of the Subcommittee, GAO conducted an investigation of the Coast Guard's effort to develop a modernized EHR system and account for how the Service could expend over \$66 million with nothing to show for it. That investigation found that financial, technical, schedule and personnel risks led to the Coast Guard's decision to cancel the project. For nearly the entire span of the project, the Coast Guard allowed program managers to handle the IHIS project without sufficient oversight by acquisition professionals. At the same time that the project was expanding, the Coast Guard established its

NMAP policies to provide oversight for information technology acquisitions with greater than \$10 million in procurement costs and less than \$300 million in life cycle costs. Despite the IHIS project meeting those parameters, it was never brought under NMAP oversight. Similarly, although the Coast Guard chartered several oversight bodies for the IHIS project, including an Executive Steering Committee, a User Group, a Change Control Board, and a System Security Committee, GAO concluded in its report that the Coast Guard “could not provide evidence that the boards had ever been active in overseeing the project prior to its cancellation.” (GAO-18-59 at page 20)

WITNESS LIST

Panel I

Rear Admiral John Nadeau
Assistant Commandant for Prevention Policy
United States Coast Guard

The Honorable Earl Weener
Board Member
Accompanied By: Mr. Brian Curtis
Director, Office of Marine Safety,
National Transportation Safety Board

Panel II

Rear Admiral Erica Schwartz
Director of Health, Safety and Work-life
United States Coast Guard

Rear Admiral Michael Haycock
Assistant Commandant for Acquisition and Chief Acquisition Officer
United States Coast Guard

Mr. David Powner
Director of Information Technology Management Issues
Government Accountability Office

EXAMINATION OF REPORTS ON THE “EL FARO” MARINE CASUALTY AND COAST GUARD’S ELECTRONIC HEALTH RECORDS

TUESDAY, JANUARY 30, 2018

HOUSE OF REPRESENTATIVES,
SUBCOMMITTEE ON COAST GUARD AND MARITIME
TRANSPORTATION,
COMMITTEE ON TRANSPORTATION AND INFRASTRUCTURE,
Washington, DC.

The subcommittee met, pursuant to call, at 10 a.m., in room 2167, Rayburn House Office Building, Hon. Duncan Hunter (Chairman of the subcommittee) presiding.

Mr. HUNTER. Good morning. The subcommittee will come to order.

The subcommittee is convening today to examine the fatal sinking of the U.S.-flagged cargo ship, SS *El Faro* and, on a second panel, the Coast Guard’s failed efforts to implement an electronic health record system.

On October 1, 2015, the 790-foot U.S.-flagged cargo ship SS *El Faro* sank in the Atlantic Ocean about 40 nautical miles northeast of Acklins and Crooked Island, Bahamas. An unusual storm path, reliance on outdated weather reports, and failure to implement proper bridge resource management techniques resulted in *El Faro* sailing almost directly into Hurricane Joaquin, a category 4 storm with an estimated sustained wind speed of 115 knots.

The loss of the U.S.-flagged cargo vessel *El Faro*, along with its 33-member crew, ranks as one of the worst maritime disasters in U.S. history and resulted in the highest death toll from a U.S. commercial vessel sinking in almost 40 years.

The last comparable U.S. maritime disaster was the sinking of the U.S. bulk carrier *Marine Electric* off the coast of Virginia in February 1983, in which all but 3 of the 34 persons aboard lost their lives. The Coast Guard instituted major changes following that tragedy to improve safety and prevent similar events from occurring in the future.

Despite those efforts to improve safety, tragedy befell the *El Faro*.

On October 31, 2015, a U.S. Navy vessel located the main wreckage of *El Faro* and the vessel’s voyage data recorder was successfully recovered. It contained 26 hours of bridge audio recordings and other critical navigation data that were used by the Coast Guard and the NTSB investigators to understand the causes of this

horrible incident and develop recommendations to prevent future tragedies.

The Coast Guard Marine Board of Investigation made 31 safety and 4 administrative recommendations to address the causes of the *El Faro*'s sinking. In December 2017, the Commandant of the Coast Guard released his Final Action Memo on the Marine Board's recommendation. The Commandant concurred with 29 of 31 safety recommendations and 3 of 4 administrative recommendations.

The National Transportation Safety Board launched an investigation as soon as the sinking of *El Faro* was confirmed, ultimately providing numerous recommendations for responsible entities, including the Coast Guard, the International Association of Classification Societies, and the owner of *El Faro*.

The Nation relies on our merchant mariners and the U.S.-flagged ships they sail. It is critical that policies are in place and adopted as standard practice to ensure mariners' safety. In order to do so, we must learn from the loss of the *El Faro*. I look forward to discussing how this tragedy occurred and what steps are being taken to prevent another such incident from occurring.

Notwithstanding the importance and gravity of the *El Faro* tragedy, on panel 2 we will examine the Coast Guard's apparent inability to implement an electronic health record system to manage data for its over 56,000 Coast Guard members and retirees.

After wasting more than \$66 million over a 5-year period, the Coast Guard canceled its electronic health records effort, referred to as the Integrated Health Information System project.

The Service has nothing to show for the time and money expended and finds itself in a worse position than before it awarded the first contract almost 8 years ago.

Today the Coast Guard is still handling all medical information using paper records, records that cannot be shared with the Department of Defense or the Department of Veterans Affairs system.

Following a subcommittee request to review Coast Guard actions, the Government Accountability Office found that for nearly the entire span of the project, the Coast Guard allowed program managers to act without sufficient oversight by acquisition professionals. Even when the Coast Guard established its nonmajor acquisition process policies to provide oversight for information technology acquisitions, things like the Integrated Health Information System project, they did not implement any oversight.

Despite chartering several oversight bodies for the project, GAO found that the Coast Guard, "could not provide evidence that the boards had ever been active in overseeing the project prior to its cancellation."

Other than realizing they had been throwing away good money for years, the Coast Guard still cannot provide a solid explanation as to why it canceled the Integrated Health Information System project.

The Coast Guard needs to show what it has learned and how things have changed as it works to finally implement an electronic health record system. We understand the Service is following its acquisition policies for the current effort and has conducted signifi-

cant research which pointed to a recommended solution of using an existing Federal agency system. That is amazing.

After a 5-year epic failure, these are positive steps. However, we need to hear more about the policies and procedures that are now in place to prevent the waste of taxpayer money in the future.

I look forward to discussing how this debacle occurred, what steps the Coast Guard is taking to ensure nothing like this can happen again, and where the Coast Guard is in the process of finally acquiring an electronic health record system.

I thank the witnesses for being here today, and I look forward to hearing all the various testimony on the various issues.

And I yield to Ranking Member Garamendi. You are recognized.

Mr. GARAMENDI. I yield to—

Mr. HUNTER. Yield to the ranking member of the full committee, Mr. DeFazio.

Mr. DEFazio. Thank you, Mr. Chairman. And I thank the ranking member for that. I have to run to a press event and then I will be back.

First off, I am concerned that we are merging two totally unrelated subjects here. Certainly, the acquisition failure is important. Whether it merits a hearing or not, I am not sure, but it certainly shouldn't be taking away from a focus on the *El Faro* tragedy.

This was totally preventable. And I think there are a number of factors and things that require the attention of the subcommittee.

First off, there are real questions about the Coast Guard, whether their budget is adequate to carry out this very, very important function. I think it is not. I think we have spread them too thin. And they are relying far too much on classification societies without any substantial oversight of those classification societies.

And from some in the industry, I understand there are companies who do a good job and there are other companies, if you pay them, they will certify your rust bucket as seaworthy.

Now, that is just not right, and that really requires some scrutiny. It also requires us to question how we got to that point, and what we can do to rectify that.

I think that the Coast Guard should have resources adequate to, minimally, to oversee these classification societies. Perhaps we need to have some sort of a system where we either certify them or decertify them for U.S. certification.

Now, they can go to these nonexistent countries with these registries and certify rust buckets. We can't control that, but we can control whose certifications we accept here in the United States of America, and that, I think, played a substantial role in this.

Plus, real questions about, obviously, the management of TOTE and the training that TOTE provided, the adequacy of the life-saving supplies on the ship, all the questions about when the ship had a major conversion, why it wasn't considered a major conversion, and, therefore, they didn't have to upgrade things, what brought that about, which might have saved lives in this case.

There is just a host of questions. And I hope we can really drill down on that, and I hope we don't get distracted with the second panel.

Thank you, Mr. Chairman.

Mr. HUNTER. I thank the ranking member.

From I understand, too, it is hard to get committee time, because we won't do in this full committee multiple subcommittees at the same time. So we don't do freeways and Coast Guard, which enables the ranking member and others to attend, but we are out of days for stuff. So we are going to focus for the first hour on the *El Faro*, or however long it takes us, before we move on.

Mr. Garamendi, you are recognized for your opening statement.

Mr. GARAMENDI. Let's get on with the hearing. Without objection, my testimony will be in the record.

Mr. HUNTER. Without objection, so ordered.

Mr. GARAMENDI. And I think I will just let it go at that, with a couple of very brief statements.

It was 35 years ago that the Marine Board of Investigation made a report about the faults of two systems in the maritime safety programs. Here we are again, essentially the same report being issued, this time on the *El Faro* situation.

The question is, why are we back with the same recommendations to address the tragedy of the *El Faro*? Bottom line is, why didn't we get it right in the last 35 years?

With that, my testimony, my written, will be in the record.

Mr. HUNTER. I thank the gentleman.

And I ask unanimous consent that members not on the subcommittee be permitted to sit with the subcommittee at today's hearing and ask questions. Without objection, so ordered.

On the first panel we will hear from Rear Admiral John Nadeau, Assistant Commandant for Prevention Policy for the United States Coast Guard, and the Honorable Earl Weener, Member of the National Transportation Safety Board, accompanied by Mr. Brian Curtis, Director of the Office of Marine Safety for the NTSB.

Admiral Nadeau, you are recognized to give your statement, and welcome back.

TESTIMONY OF REAR ADMIRAL JOHN P. NADEAU, ASSISTANT COMMANDANT FOR PREVENTION POLICY, U.S. COAST GUARD; AND HON. EARL F. WEENER, PH.D., BOARD MEMBER, NATIONAL TRANSPORTATION SAFETY BOARD, ACCOMPANIED BY BRIAN CURTIS, DIRECTOR, OFFICE OF MARINE SAFETY, NATIONAL TRANSPORTATION SAFETY BOARD

Admiral NADEAU. Good morning, Chairman Hunter, Ranking Member Garamendi, distinguished members of the subcommittee. I am honored to be here today.

Mr. Chairman, I want to especially thank you for your leadership and enduring support to the Coast Guard.

On behalf of all the men and women in the Coast Guard, I offer our deepest condolences to the families of the 33 mariners lost on-board *El Faro*.

As our Commandant noted in the Final Action Memo, the loss of the *El Faro* and everyone aboard was a tragic and preventable accident. This is a call to action for the entire maritime community. The Commandant is committed to making improvements within the Coast Guard and the maritime industry and has directed me to do so.

The Marine Board of Investigation conducted an exhaustive 2-year investigation in full view of the public. While the primary

cause of the casualty was the decision to navigate *El Faro* too close to the path of Hurricane Joaquin, there were other contributing factors.

These include, one, the failure of TOTE Services, Incorporated, to maintain an effective safety management system; two, the failure of the ship's classification society, ABS [American Bureau of Shipping], on multiple occasions to uncover or otherwise resolve longstanding deficiencies that adversely affected the safety and seaworthiness of vessels; and, three, failure of the Coast Guard to properly oversee the work conducted by ABS on our behalf.

To determine if these issues revealed in the *El Faro* investigation are pervasive throughout the fleet, I directed a team of senior marine inspectors to closely examine more ships currently enrolled in the Alternate Compliance Program, or ACP. We have found additional evidence of breakdowns in the safety framework, and our findings confirm concerns raised in the investigation about the material condition of several other U.S.-flagged vessels.

All elements of the safety framework—the vessel owners and operators, the class societies, and the Coast Guard—must all improve.

The vessel owner is accountable for properly maintaining and ensuring the safe operations of the vessel.

The class society plays a key role in ensuring safety by providing thorough and accurate surveys and compelling corrective actions when needed.

The Coast Guard is the final element in the safety framework by verifying compliance with mandatory safety standards.

As was noted in the Federal Register announcing the program more than two decades ago, ACP was created in response to the needs expressed by the U.S. maritime industry to reduce the regulatory burden and alleviate duplication of effort between the Coast Guard and class societies.

Since day one, the Coast Guard has committed to providing oversight to ensure that vessels participating in ACP are maintained and operated to the same level of safety as vessels inspected by the Coast Guard under the traditional process.

Today we remain committed to this goal and acknowledge we must do better.

The U.S., like other flag states around the globe today, now relies far more heavily on third parties than ever before. In fact, the vast majority of the U.S. sealift fleet that DoD relies on to transport America's soldiers, Marines, and their equipment overseas, uses class societies for many of their compliance activities.

Now, more than ever, we need to get this right. The Coast Guard must and will restore the safety framework with robust and thorough oversight and accountability.

I am taking a number of steps to do so. I will lead the actions directed by the Commandant in response to this tragedy. I am reforming our oversight program and directing changes to the organization, the procedures, the policy, the training, and the capture and management of key information.

These actions are needed to ensure accountability for the maritime industry, the authorized class societies, and the Coast Guard. The Coast Guard has the authority and the competency needed to

successfully accomplish this. As I pursue these actions, I will be transparent and keep you all informed.

At the end of the day, this is about the lives of the men and women who go to sea in support of the Nation's economic prosperity, in support of our military readiness, and in support of our national security.

I recently had the opportunity to visit the *El Faro* Memorial in Jacksonville. I also met some of the mariners who had once sailed on the *El Faro* and now mourn the loss of their shipmates. It was a moving and humbling experience.

This tragedy has shined a spotlight on failures of the safety framework. We must honor the 33 lost mariners with a strong bias towards action.

The Coast Guard, after the vessel owner and the class society, is the final element in the safety framework responsible for ensuring compliance with mandated safety standards. The Coast Guard must and will restore the safety framework.

Again, thank you for your strong support of the Coast Guard. Thank you for the opportunity to testify today. I ask my written statement be entered into the record. I look forward to your questions.

Mr. HUNTER. Without objection. Thank you, Admiral.

Mr. Weener, you are recognized.

Mr. WEENER. Good morning, Chairman Hunter, Ranking Member Garamendi, and members of the subcommittee. Thank you for inviting the NTSB to provide testimony today.

Mr. HUNTER. Would you mind pulling the microphone a bit closer to you? Thank you.

Mr. WEENER. I am accompanied by Brian Curtis, the Director of our Office of Marine Safety.

My testimony will discuss the NTSB's investigation into the sinking of the cargo ship *El Faro* and the loss of all 33 crewmembers aboard.

The NTSB-led investigation and was a joint effort with the United States Coast Guard. Four days after the sinking, the NTSB, Coast Guard, and many other organizations began a collaborative search of the ocean floor seeking the *El Faro* wreckage and in an effort to locate and retrieve the ship's voyage data recorder, or VDR.

Data recorders are important investigative tools critical to many of our investigations. It took three missions to recover the VDR. Analysis revealed significant data, including 26 hours of audio, which was crucial in determining the probable cause of *El Faro*'s sinking.

On September 29, 2015, at 9:48 p.m., the *El Faro* and its crew departed Jacksonville, Florida, for San Juan, Puerto Rico. Operated by TOTE Services, the U.S.-flagged ship was slated to arrive in the early morning hours of October 2. However, rather than routing around the approaching storm, the ship sailed directly—

Mr. HUNTER. Mr. Weener, I am sorry, there is wind going through here and I have bad ears. Do you mind pulling that thing really close, please, and speak louder if you could. There is like wind blowing through here behind us. And I have got artillery ears.

Mr. WEENER. On September 29, 2015, at 9:48 p.m., the *El Faro* and its crew departed Jacksonville, Florida, for San Juan, Puerto Rico. Operated by TOTE Services, the U.S.-flagged ship was slated to arrive in the early morning hours of October 2. However, rather than routing around the approaching storm, the ship sailed directly into the path of the hurricane and sank at approximately 8 a.m. on October 1.

My written testimony provides more detail regarding what happened during the voyage that led to the ship's being in harm's way. For now, I will focus on major safety issues identified in our report.

The NTSB's probable cause determination for this accident included the captain's decisionmaking and actions, which put the *El Faro* and its crew in peril. The captain did not divert to safer routes to avoid Hurricane Joaquin, failing to heed junior officers who suggested an alternate course was necessary to avoid the hurricane.

We found that although the *El Faro* received sufficient weather information to facilitate appropriate decisionmaking by the captain regarding the vessel's route, the captain did not use the most current weather information available to him.

In addition, the investigation revealed the captain's light regard for the crew's suggestions and the crew's lack of assertiveness in stating their concerns to the captain. The NTSB found that the bridge crew did not use all available resources, nor act effectively as a team to safely operate the ship.

The *El Faro*, sailing on a collision course with Hurricane Joaquin, was further imperiled by the failure to maintain the ship's watertight integrity. Seawater entered a cargo hold through an open scuttle. The resulting flooding caused improperly secured automobiles to impact an inadequately protected fire pump supplied by piping carrying seawater.

The damaged piping allowed seawater to flow unchecked into the ship. This exacerbated other flooding causes, caused by water entering through open, unsecured ventilation closures.

In addition, the TOTE safety management system was inadequate. Its lack of oversight in critical aspects of safety management denoted a weak safety culture in the company and contributed to the sinking of the *El Faro*.

Finally, the captain's decisions to muster the crew and abandon the ship were late and likely reduced the crew's chance of survival. The severe weather, combined with *El Faro*'s list, made it unlikely that liferafts or lifeboats available on the ship could be launched or boarded by crewmembers once in the water. The lifeboats on-board would not have provided adequate protection, even if they had been launched.

Coast Guard standards do not require older ships, such as the *El Faro*, to adhere to the latest safety standards.

These are just a few of the issues identified out of a total of 81 findings and 53 safety recommendations. As with all investigations, our aim is to learn from this tragedy to prevent similar events from occurring again. We believe that the adoption of our recommendations will help improve safety for current and future generations of mariners.

Thank you again for the opportunity to testify, and I am happy to take your questions.

Mr. HUNTER. Thank you, sir.

Mr. Curtis, you are recognized.

OK. You are just accompanying. So I will start out by recognizing myself. Thank you very much for being here.

My question is pretty simple. If they would have closed the hatches or the ventilation systems, right, so the water could not get in, in the heightened sea states that they had, would they have been OK, if their engines would not have failed and they hadn't taken on water? Could they have sailed through?

Mr. WEENER. I think our investigation showed that this was a series of events, a chain of events that had it been interrupted at any point, the chain would not have been completed. So it started with a decision to not avoid the hurricane. Once they got into heavy weather, they had a scuttle that got flooding in one of the holes—

Mr. HUNTER. When you say an open scuttle, what is that? Can you tell the committee what that is?

Mr. WEENER. That is a hatch going between decks that for heavy weather should have been closed and locked, but it was left open. So they got down-flooding with that. Basically, there was a whole series of events.

Mr. HUNTER. Mr. Curtis? Admiral?

Admiral NADEAU. Sir, I would add to that.

In the Coast Guard's perspective, I think it is difficult to say. It is hard to simplify it to that level. It is a series of events that go on, that chain of events that occurred, and I think it would be very difficult for us to say with any degree of certainty whether or not simply closing vents would have prevented this casualty.

Mr. HUNTER. What I am trying to get at is you have all of these recommendations, right? And you can go through a ship or an airplane or anything, military or civilian, and say, this isn't up to code, or this is unsatisfactory, or we are going to allow this to slide because of the age of the vessel or the aircraft or whatever.

But what I am trying to get at is, if all of those things were followed then the right decisions would have been made in the first place and the chain of events would not have happened.

But it is not like the ship broke in half because the weld wasn't right or something or it passed an inspection where it failed on the structure of the ship. It was decisionmaking and not paying attention to detail that caused the initial stuff, right?

I mean, the captain sailed into the hurricane, not around it, and they had basically open hatches on the ship that allowed water to get in, and then, boom, right? That is sort of the really fast chain of events, I am guessing.

Is that correct, roughly?

Admiral NADEAU. Sir, our investigation concluded that it is likely the material condition of the ship did contribute as well and that the watertight fittings that would be relied upon to prevent progressive flooding were not in the condition they should have been maintained.

Mr. HUNTER. Mr. Curtis.

Mr. CURTIS. Certainly, as you point out, that was a significant event in the series of events, having the hatch open. And our report made recommendations to that very point to hopefully prohibit it from happening in the future, with having alarms and notifications if a hatch is left open, that it should be closed.

But it was, as you said, a significant—

Mr. HUNTER. To me, you had, when I was in Fallujah, you had M1 Abrams tanks every now and then that would roll over into ravines and the Marines would die. They would go over into irrigation canals, right?

It wasn't anything wrong with the tank. They might have had some things that weren't up to code, but it is wartime, but there wasn't anything wrong with the tank, but they changed how they drove around irrigation canals. And I would guess that that is a lot of your recommendations that say, do this next time, don't do that, right?

Mr. CURTIS. Certainly in our report. Yes, sir.

Admiral NADEAU. Sir, I would only add, during this investigation we went aboard the sister vessel, the *El Yunque*, which was in similar service, similar build date, maintained by the same company, and that ship ended up being scrapped after we went on-board based on the material condition.

Mr. HUNTER. And TOTE was in the process of rebuilding these—or building the new class of these anyway, right, as this happened. [Admiral Nadeau nods.]

Mr. HUNTER. This ship, the *El Faro*, was going to be pulled out of the line, I would assume, in the next couple—or now, right, if it had stayed afloat.

Admiral NADEAU. Sir, I believe the intent was to shift the *El Faro* to the northwest so that it would go into trade back and forth to Alaska while they were still working to deliver the final two new containerships that were being built.

Mr. HUNTER. Thank you.

Mr. Garamendi, you are recognized.

Mr. GARAMENDI. I am not going to spend a lot of time focusing on the mistakes made by the captain and the crew along the way. Those are well documented in the report.

Going forward, the utility of the National Transportation Safety Board report and the Coast Guard is really where I want to focus here. How can we prevent this kind of accident from occurring again?

So to the Coast Guard who has oversight of the safety of ships and the associations that are specifically responsible for reviewing a ship, what are you doing to assure us that the various associations and organizations that review the safety of ships is actually taking place and is robust enough to assure that the ship is safe? Then there is a series of questions about the competency of the men and women on the ship.

So, first, what are you doing to assure us that the organizations that review the safety of the ships actually do their job?

Admiral NADEAU. Ranking Member Garamendi, for starters, we want to see how pervasive these conditions were throughout the fleet. So I have a team out visiting what we would view as the high-risk vessels that are enrolled in ACP, based on their age,

based on their history, based on their casualties, et cetera. And the findings indicate that it is not unique to the *El Faro*, we have other ships out there that are in substandard condition.

We have moved out to reform our oversight program. It starts with governance and having the proper people in place with the proper focus to call attention and hold others accountable. That also involves having the right policy and procedures in place, the right information management systems to capture the data, collect it, and then engage with our third parties and communicate to hold them accountable.

So it is an ongoing effort. It will take us a little time. But we have launched and we are underway and committed to rectifying the problems that we are finding.

Mr. GARAMENDI. Do you have a tracking system, a review system in place, so that you know what is actually taking place as you attempt to improve your oversight?

Admiral NADEAU. We have a—it is called MISLE, it is an information management system we use for all of our marine safety activities and others. It has not been able to capture some of the information we want it to capture, so we are making changes now to improve that system.

At this time it is difficult for our people in the field, when they do find things, to properly incorporate it into MISLE so we can roll up all that data, all that information, and then engage with our third parties to talk to them about the problems we are finding.

Changes are underway, so we will have that capability and be able to make sure we have the information to engage with them.

Mr. GARAMENDI. So there is a reporting system that has not worked well in the past when your people in the field find something is amiss. No reporting up the chain of command, and then no action by the chain of command. Is that what has happened in the past?

Admiral NADEAU. The procedures, the processes, the training, and the information capture all need to be improved.

Mr. GARAMENDI. Well, we are towards the end of January here, and I suppose you have a tracking system in place so that you know that there are improvements underway?

Admiral NADEAU. We do, sir. We are working, have a team assembled that is working on this, and we have moved out to actually look at the ship.

So I guess there are a couple efforts. One, again, is in the field, getting aboard the ships, and trying to call out those requirements and raise the condition of those ships that need it. And the second thing is to actually make structural changes within our processes and our procedures and those tools we use to better enable us to conduct the proper oversight.

Mr. GARAMENDI. All right. I was just talking to our chairman and his staff. I am going to turn this back to the chairman about a request for a matrix on exactly what you are doing and timeframes.

Mr. HUNTER. Which you have, which you are going to give us, right?

Admiral NADEAU. I can do that for you, sir.

Mr. HUNTER. We have already asked you for it.

Admiral NADEAU. OK.

Mr. HUNTER. So somebody is working on it. Anybody here working on it who would know when it would be given to us?

OK.

Mr. GARAMENDI. Well, let me just take it up here.

If you have a system in place to improve the review and oversight not only of the work you—that the Coast Guard is doing, but also of the various organizations to whom you have assigned responsibility, this committee would like to have that tracking system, that matrix, that reporting program, as to exactly how you are tracking the safety programs, and then an update, a report 6 months from now as to how it is going.

Can you do that?

Admiral NADEAU. Yes, sir.

Mr. GARAMENDI. Good. Thank you.

For the NTSB, with regard to the action in itself, you report you have, I don't know, I am trying to add up the number of at least 20 or 30 different recommendations. Do you ever go back and follow up on your recommendations as to whether they are actually done, Mr. Weener?

Mr. WEENER. Yes, we do. We make these recommendations, safety recommendations, to a variety of parties, but the majority in this case have gone to the Coast Guard. We send these recommendations off, we expect acknowledgment of receipt, and then we track them from that point on.

We have some expectations of how long it is going to take to get a response. But we constantly keep track of the recommendations until such time as they are "Closed Acceptable," in some cases "Closed Unacceptable," but we track them all the way through.

Mr. GARAMENDI. So your recommendations came out more than a month, almost 2 months ago now, the final version, I think that is the date. And have you had any success or have you seen any improvement, any action on your recommendations yet, some to the Coast Guard, some to the shipowners?

Mr. WEENER. At this point in time we would just expect to be getting an acknowledgment that they have the recommendation. At this point we would hope that they would give us some idea of what their plan was and how long it was going to take.

Mr. GARAMENDI. Our role here with regard to the Coast Guard is to make sure they are doing their task of maritime safety. And for the NTSB, your work to report to us, Mr. Curtis, I think this is your specific responsibility.

What is your timeframe on following up on the recommendations, both to the shipping industry as well as to the Coast Guard? We just asked the Coast Guard for their matrix for review, and I am asking you for your matrix for review, your timeframe, your schedule.

Mr. CURTIS. Yes, sir. So as you said, the recommendations would go out as the adoption date shortly after once they are forwarded to the parties, and they have 90 days to make their initial response to how they respond to the recommendation, what they would do. And TOTE has implemented some changes to those recommendations. There are about 10 recommendations to TOTE.

But for all parties, whether they go to the Coast Guard, TOTE, other agencies, NOAA, some to NOAA, they have 90 days for the initial response. And then we have an office, Office of Safety Recommendations, which corresponds directly with them on an ongoing basis. And when they get a response back from those recipients of the recommendations, specific ones are forwarded back to our office to respond that we feel whether they are appropriate or not.

And so we work through back to the Safety Recommendations Office and ultimately back to the recipient of the recommendation. So in this case there were 53 recommendations, so we will be very active and proactive in working with the Office of Safety Recommendations and the recipients.

Mr. GARAMENDI. It seems to me that the committee should be aware of this response loop that you just described. I would appreciate it if you could provide to the committee a continuous update on the progress by both the Coast Guard and the shipping industry in addressing the multiple recommendations that you have made. When might you be able to provide that update to us?

Mr. CURTIS. Sir, we can provide that any time. I can work with through Office of Government Affairs to work with your folks to give you an update at any period you specify. Certainly we are available at any time to give those updates.

Mr. GARAMENDI. I am going to yield back at this point, but before I do, for me and my particular role here, the NTSB's recommendations and the response of both the Coast Guard and the shipping industry generally, written large, is really important.

So I would appreciate it if the NTSB, towards the middle of this coming year, like maybe June, report back to us on what progress has been made, what outreach you have done to NTSB with regard to the recommendations that you have made. They are of no value unless somebody follows up on them. So I would appreciate it, Mr. Curtis and Mr. Weener, if you would do that.

And similarly the Coast Guard with regard to all of the recommendations and updating both with regard to the recommendations as well as with regard to the improvements on the oversight of the various organizations that do the safety reviews.

And with that, I yield back. Thank you, Mr. Chairman.

Mr. HUNTER. I thank the ranking member.

Quick question. Does every ship being built now have an indicator for the hatch being closed, the hatches around the ship, if they are below a certain—

Admiral NADEAU. There are standards in place for newer ships that are being built, yes, sir.

Mr. HUNTER. So that is in effect now? So all big ships being built, cargo ships, have a little light with all the hatches that says that they are closed or open?

Admiral NADEAU. They have indicators, as well as there is flooding detection in the hold spaces to alert them if there is water coming into that space. Yes, sir.

Mr. HUNTER. Thank you.

I would like to yield to the ranking member, which we are honored to have here with us.

Mr. DEFAZIO. Thanks, Mr. Chairman.

Well, I read a lot about this, and I really don't like systems that foster preventable tragedies that take 33 lives.

Admiral, the Coast Guard subsequently looked at the sister ship, *El Yunque*. What was the condition of that ship?

Admiral NADEAU. It was in substandard condition.

Mr. DEFAZIO. And so we can assume that *El Faro* was, as the sister ship, in similar substandard condition?

Admiral NADEAU. The Coast Guard's Marine Board certainly made that same conclusion, sir.

Mr. DEFAZIO. And was this boat certified by ABS?

Admiral NADEAU. Yes.

Mr. DEFAZIO. And what did they say about the boat? Did they note deficiencies? How recent was their inspection? Isn't it annual?

Admiral NADEAU. Yes, they would be on there every year, as would the Coast Guard. I don't know when the last survey had been. I don't recall on the *El Yunque* when the last survey was. Certainly, we found things that should have been captured in the course of the normal routine of surveys and Coast Guard inspections.

Mr. DEFAZIO. So things were omitted.

Now, when is the last time that you are aware that one of these alternative compliance folks told a company they had to take a ship out of service and make very significant repairs or just retire it, as they did *El Yunque* once you looked at it?

Admiral NADEAU. I am aware of others that have been in similar condition that have had to come out of service. But I would say probably—it is not frequent. It is not frequent.

Mr. DEFAZIO. Right. I mean, it is a competitive industry, right? And so I hire you, I am hiring you to certify my rust bucket, I would rather not hear about it, or you tell me about it and then I am probably not going to hire you again, right? I mean, if they aren't being adequately overseen.

What is the liability of the classification people in this case? Is there potential liability for them? Are they being sued because they overlooked things?

Admiral NADEAU. That is a little bit outside my area of expertise regarding the liability. I can reassure you that certainly we recognize the importance of proper oversight over all classification societies, all third parties that we entrust to do our work, to help us. And we are committed, again, to trying to rectify that.

Mr. DEFAZIO. Do you feel there is any conflict in your mission here where you are both to facilitate and promote seaborne commerce and at the same time you are supposed to protect the life and safety of the mariners?

Many years ago, I offered an amendment in this committee where the FAA had that dual mandate, and I asked, is that a problem, and they said no.

Then we had a tragic, totally preventable airplane crash. And after that came out, somehow my amendment got into the bill without having been passed on either side of the Hill, because people realized that this was a horrible problem for the FAA, to be both promoting an industry which is very mature and didn't need promotion and regulating safety, and I substantially took away the promotional aspects.

Should we be moving the promotional aspects or mandate over to Commerce? It seems a more logical place than the Coast Guard.

Admiral NADEAU. I don't know that I find my role as promotion. I think that we balance, we try and be practical and apply common sense when we apply the standards that are either developed by Congress or that industry has asked for. I think we rely more on the safety side of things and we try and ensure that there is a level playing field out there, that we equally apply the regulations.

And I would offer also, sir, that we are not the only flag in the world, the only country in the world that relies on third parties. Virtually every flag state out there today relies on these classification societies in some way, shape, or form. It is just the way the system has evolved. But we need proper oversight in order to ensure that all parties are doing what they are responsible for doing.

Mr. DEFAZIO. Yeah. And what would constitute proper oversight? I mean, in this case, let's just say had the Coast Guard had adequate staff, *El Faro* was surveyed, deficiencies were not noted. And if you had followed on with a comprehensive inspection and found deficiencies that weren't noted, what would be in consequences for that classification society?

Admiral NADEAU. Well, first off, we would have made sure that the ship—should have made sure the ship is in proper condition and does not have the problems that were found. Secondly would be to have a scheme in place to make sure that we do hold those class societies accountable.

So it starts at the basic level of getting onboard the ship to observe the standards onboard the ship to see if they are meeting the minimum standards.

Secondly, it is digging into the safety management system aboard the ship and aboard that company that they have to make sure that they have the proper systems in place to maintain the ship.

And, thirdly, it is looking at the quality system in place by those third parties to make sure that they have the proper training, the proper procedures in place to make sure they capture and resolve these things when they find them.

Mr. DEFAZIO. Is there any way to assess a penalty against the classification society that does an inadequate survey that endangers life and safety or to suspend their capability to do alternate compliance?

Admiral NADEAU. I don't know that we would pursue the penalty. I think probably the larger ramifications would be either preventing them from doing that work on our behalf. They all have a reputation they try and uphold. It is a competitive business. They are generally pretty responsive when we ask them to be. We need to make sure that we are on them, holding them accountable, and ensuring they take the proper response.

Mr. DEFAZIO. I mean, it just all reminds me a little bit of the junk bonds on Wall Street that caused the worst economic collapse since the Great Depression where all of these bonds were given very high ratings because it was well known if you didn't give this junk high ratings, they wouldn't hire you to give the junk high ratings, and you lose business. I don't see how it is any different here.

Admiral NADEAU. Sir, I would say, here the difference is we know how to do this work. I have asked myself over and over again, how did this happen? We learned this lesson, yes, with *Marine Electric*. Since then we have doubled down time and time again, investing more and more in third parties, whether it is through Congress or the industry asking us to push more and more through the third parties.

And we have gone through changes in the Coast Guard where we stood up sectors. We used to have marine safety offices working for district M captains. Now we have sectors, which are very powerful, allow us to do things we could never do before, like we saw this summer in response to the hurricanes. But along the way I think we have lost a little bit of our focus and we are doubling down now to get that back.

Mr. DEFAZIO. And you have got adequate resources to do that?

Admiral NADEAU. As always, you could do more if you had more. But this is not strictly a capacity problem. There are elements to training. If you just gave me another 1,000 marine inspectors, it wouldn't solve this problem. This problem involves training. This problem involves getting the right information. This problem involves getting the right policy and procedures in place.

Entry-level marine inspections is not what I am talking about. I need to have a small corps—it is not a lot—a small corps of people that can get out and are highly trained and proficient and stay focused on this area until we get it right.

Mr. DEFAZIO. OK. All right. Thank you.

Thank you, Mr. Chairman.

Mr. HUNTER. I thank the ranking member.

Does anybody else have any questions for this panel? Any of my Republican colleagues? I will take that as a no.

I thank you very much for being here and talking with us on this. And with that, we will move on to the next panel.

Mr. GARAMENDI. Mr. Chairman.

Mr. HUNTER. Please.

Ms. GARAMENDI. Before we move on, we have a series of questions that we would like to submit for the record. Many of these have already been discussed here. Let me just review very quickly and make sure that we cover what we want to cover.

I want to specifically ask Admiral Nadeau, the recommendations from the NTSB, numerous as they are, I am just going through them, I think there are 20 or 30 of them, have you responded to those recommendations? Almost all of them are specific to the Coast Guard.

Admiral NADEAU. Thank you for that question.

We look forward to getting the entire report so we can go through them. We have seen the recommendations that were published, I guess a summary notice when the hearing was held.

In looking at those, I can already tell, they are very close to the recommendations we made in our own Marine Board investigation, our own report. We had 36 recommendations. Many of those are very, very similar to what is coming from the NTSB.

So, yes, I think that we will respond. We have a process in place to provide them feedback on each one of those, and we will care-

fully assess their information, the report, and each recommendation.

Mr. GARAMENDI. When will you have your initial review and response to the recommendations?

Admiral NADEAU. As soon as we get the report—as soon as the report is published, we will begin our review. And as I indicated, I think there is a timeline, I don't think it is laid out in our MOU, but there is a timeframe we meet. I don't know if it is 30, 60 or 90 days. But we will certainly meet that and do our best to meet the timeline that is established in the procedures.

Ms. GARAMENDI. Mr. Curtis, when will it be finalized?

Mr. CURTIS. The report will be out mid-February, the 15th, and the recommendation letters right around that time.

Mr. GARAMENDI. So the 90-day response cycle, is that—

Mr. CURTIS. The 90-day response cycle will start right around mid-February, maybe a little earlier, but soon. But they have been released in the abstract of the report.

Mr. GARAMENDI. OK. And presumably, I can't count, there are 53 specific recommendations. I lost count somewhere around 30. We will be interested in hearing the response from the Coast Guard.

Also, does the shipping company or companies also respond?

Mr. CURTIS. Yes, it is the same process for all recipients of NTSB recommendations, sir.

Mr. GARAMENDI. OK. We will await that. Thank you very much.

I yield back and thank you. And I do have specific questions for the record.

Mr. HUNTER. Without objection, we will give the gentleman authority to submit questions for the record.

So we are looking for from the Coast Guard and from NTSB the matrix that he is talking about earlier. I got those confused. He would like the types of ships—and correct me, Mr. Garamendi, if I am wrong—the types of ships that are like the *El Faro* that you have been looking at now, the same year range, I guess, that are out there.

I think that is what he is asking for, not the matrix of recommendations and accomplishments, which is separate. So both of those things. But we would like to see all of those ships that you are out there looking at now, saying these could be at risk.

In closing, I drive a 1997 Expedition. If you were to go through the check list on my truck, there is probably a lot of stuff on it that is not correct, like the middle seatbelt in the back doesn't work, the airbag is out on the passenger side.

But if I take my seatbelt off, as a driver, when it is pouring down rain and go driving on the freeway at 90 miles an hour and crash it, you can look to all those things that weren't up to code in my truck, but the reason that it crashed and I died is because I drove it without my seatbelt in pouring rain at 90 miles an hour.

In the end, you can make all the recommendations you want to, but if you leave hatches open in high sea states and drive into a hurricane, bad things could happen.

I think at the end of this that is what I am kind of taking out of this, is all the structural issues, from the age of the ship and classifications and giving the ship approval to set sail, those are all

good things, but if you drive at 90 miles an hour in an old truck with no seatbelt on in pouring rain, you might crash.

So with that, yes, sir, closing statement, it is all yours.

Admiral NADEAU. Sir, I could see why you draw that conclusion. But I guess we looked a little further beyond this particular incident, caused us to look at other vessels in the fleet, and did cause us concern about their condition.

It is almost like your same old car. Some of our fleet—our fleet is almost three times older than the average fleet sailing around the world today. Just like your old car, those are the ones likely to break down. Those are the ones that are more difficult to maintain and may not start when I go out and turn the key.

Our fleet is older than the average fleet. That presents some challenges. And some of our fleet, particularly the Military Sealift Command, where it is a Ready Reserve component that kind of sits idle for long periods of time, that presents challenges for us, sir.

We are working very closely with partners at Military Sealift Command, Admiral Mewbourne, as well as MARAD Admiral Buzby, to make sure that we pay proper attention to that.

Mr. HUNTER. Thank you.

Mr. Garamendi is recognized.

Mr. GARAMENDI. Mr. Chairman, thank you for opening another avenue here that I had neglected. I know we are running up against the clock also.

There is the ship and all of the adequacies or inadequacies of the ship itself. In this particular situation, as the chairman was saying, the driver on the freeway made a serious mistake.

Are the men and women who are responsible for the safe operation of the ship, both from shore as well as on the ship itself, are they adequately trained? Are they over a period of time recertified? Are there questions that we should be raising about the adequacy of the men and women responsible for the ship itself? And is the Coast Guard also investigating that piece?

Admiral NADEAU. Yes. There were recommendations related to training, both with respect to weather forecasting, meteorology, and also with bridge resource management, and other aspects that were highlighted here.

Mr. GARAMENDI. OK. Obviously, we are not going to be able to question any of the personnel that were on the ship. But it appears that there were mistakes made in the operation of the ship, perhaps both from shore as well as from the ship itself while at sea.

Does the NTSB or the Coast Guard have any concerns about the adequacy of training of the personnel that are on American ships that are currently on the oceans? Do we have any recommendations for upgrade, for continuing classification, and for review of their ability to properly conduct the ship?

Mr. WEENER. The NTSB has recommendations related to training and bridge resource management, both recurrent training as well as initial training, for things like heavy weather, for advanced meteorology, for deck crews. So that aspect of training has also been included in their assessment in our investigation.

Mr. GARAMENDI. My final point is that the ability and capability of the men and women in charge of running the ship has to be continually observed and with a high level of assurance that they are

competent and capable. In the NTSB report, among your 53 recommendations, there are several that speak to that issue. I would expect that in the responses, both from the shipowner as well as from the Coast Guard, that this will be an issue that will be taken up in the responses.

My concern goes beyond this particular company and the men and women that are hired to operate the ships for this company, but rather to the entire U.S. Fleet and the adequacy of the training and the capability of the men and women that are responsible. So I would like the Coast Guard to also pick up that issue beyond just this one company.

With that I will yield back. Thank you.

Mr. HUNTER. I thank the ranking member.

Just in closing, you had two Navy ships crash last year, and it wasn't any mechanical anything. It was they took away, the last couple years, they took away surface warfare officer training, it became on-the-job training with a DVD. It used to be a 6-month school up until, I don't know, 4 or 5 years ago. They got rid of it. Training saves a lot of lives.

And looking through everything, it looks like this was poor decisionmaking that exacerbated physical problems with the ship. And I think that is what we take out of this and we will keep drilling down.

If we could get those matrixes of the ships, right, that you are looking at, so we can kind of see what is out there right now, and then the recommendations and what has actually been accomplished with those 53—52. The Commandant said, let's go with it two out of the three, the admin recommendations, he said, let's go with it. We would like to see what actions were taken that match those recommendations.

And I think June 1. Is that too long? Could you get them before that? We can get the ship matrix before that probably. But as soon as you have it, we would like to see it.

Mr. GARAMENDI. June 1 is good.

Mr. HUNTER. June 1 is good with the ranking member, so it is good with me.

And with that, thank you all very much. And we will move on to the next panel.

Lady and gentlemen, thanks for being here.

We will move on to the second panel. We will hear from Rear Admiral Erica Schwartz, Director of Health, Safety, and Work-life with the United States Coast Guard; Rear Admiral Michael Haycock, Assistant Commandant for Acquisition and Chief Acquisition Officer with the United States Coast Guard; and Mr. David Powner, Director of Information Technology Management Issues with the Government Accountability Office.

Admiral Schwartz, you are recognized.

TESTIMONY OF REAR ADMIRAL ERICA SCHWARTZ, DIRECTOR OF HEALTH, SAFETY, AND WORK-LIFE, U.S. COAST GUARD; REAR ADMIRAL MICHAEL J. HAYCOCK, ASSISTANT COMMANDANT FOR ACQUISITION AND CHIEF ACQUISITION OFFICER, U.S. COAST GUARD; AND DAVID A. POWNER, DIRECTOR OF INFORMATION TECHNOLOGY MANAGEMENT ISSUES, U.S. GOVERNMENT ACCOUNTABILITY OFFICE

Admiral SCHWARTZ. Chairman Hunter, Ranking Member Garamendi, honorable members of the subcommittee, good morning and thank you very much for your oversight and for your continued strong support of the United States Coast Guard. I am honored to testify before you today with my colleague, Rear Admiral Haycock.

Let me state now, bottom line, upfront, we sincerely regret what happened with the Integrated Health Information System, or IHiS. The Coast Guard attempted to develop an electronic health record that was ultimately unsuccessful.

What began as a project to develop a simple electronic health record increased in scope and expanded into a much larger concept, which added work-life and safety services. While well intentioned, this project lacked appropriate oversight and governance and resulted in a project that had significant mission creep, untimely delays and increased cost.

Upon realizing that IHiS was not going to be completed in a reasonable time, at a reasonable cost, the Coast Guard made the decision to cancel IHiS.

We are incorporating lessons learned as we move forward with our new electronic health record. Recognizing the criticality of the new electronic health record, it has been formally designed and designated with an acquisition with the necessary and appropriate level of governance and oversight that IHiS lacked.

As the program sponsor representative, it is my highest priority to work alongside the chief acquisition officer, the chief information officer, and other members on the governance board to leverage lessons learned and to ensure that the best choice that meets service requirements is acquired and implemented as soon as possible.

Since our outdated electronic health record had significant IT security concerns, we continued with just paper health records.

As a physician, I know firsthand the risk of managing a medical program based on paper health records. Whether it is the challenges of scheduling an appointment, difficulty in reading handwritten clinical notes, storing volumes of information, or decreased productivity, the Coast Guard cannot continue without an electronic health record system long term.

Our clinics and sick bays are managing with a paper health record system, but this is not a permanent solution. We must have an electronic health record system that is interoperable with the DoD and one that allows our members to officially transition to the Department of Veterans Affairs.

As the Coast Guard's chief medical officer, I oversee the healthcare delivery and medical services for more than 48,000 members of the Nation's fifth armed service. I have a passion for ensuring the Coast Guard has superior access to healthcare. It is my duty and responsibility to ensure that our healthcare system is able to serve our greatest asset, our people.

As we continue to pursue the very best electronic health record solution for our members, the Coast Guard is thankful for your interest and assistance on this important issue. Supported by sustained internal governance and your continued support, I am confident that the Coast Guard will implement the finest electronic health record solution.

Thank you.

Mr. HUNTER. Thank you, Admiral.

Admiral, you are recognized.

Admiral HAYCOCK. Chairman Hunter, Ranking Member Garamendi, good morning.

First, I would like to thank you for your continued support of the Coast Guard and the guidance that you provide to our military service. As my colleague has mentioned, the Coast Guard recognizes the critical need to move to an electronic health record system. And as the chief acquisition officer, I appreciate the opportunity to discuss the improvements that we have made over the last several years to apply disciplined governance to these types of investments throughout our Service.

As you are well aware, over the last 15 years or so, with the tremendous assistance of this subcommittee, the Coast Guard has undertaken significant efforts to improve the oversight and the management of our major acquisitions, such as our vessels and our aircraft.

Our acquisition framework is designed to constrain and validate requirements to provide checks and balances and provide continuous and effective oversight at all stages of the acquisition life cycle. Until recently, we did not use the same level of rigor to govern key decisions for our smaller investments.

We have learned several lessons from our experience with the Integrated Health Information System. The most important of these lessons are related to oversight and program management.

Without the oversight and guidance normally provided to our formal acquisition programs, well-meaning people were overcome by the task at hand and that program simply outgrew their capabilities. And as a result, we have made significant process improvements to manage all sizes of acquisitions, including nonmajor acquisitions.

To that end, the Coast Guard overhauled its processes of our nonmajor programs. We established formal roles and responsibilities and requirements in the same manner that we use for major acquisition programs.

These new processes established a governance framework and provided a roadmap for improving program execution and managing risk. This framework leverages the expertise of our technical authorities, including the chief information officer, to ensure that nonmajor programs remain on track and key decisions represent the priorities of all communities across the Coast Guard.

Additionally, we recently instituted new processes to identify candidates for formal acquisition management and oversight which allows us to look out for those investments, like IHiS, to prevent them from falling through the cracks.

We created an oversight council specifically to provide oversight and governance for nonmajor programs. This provides senior staff

from across the Service a forum to regularly assess performance, raise issues, and address concerns, and it also ensures we have people with the right talents and skills managing our programs.

Recognizing the continued urgent need to address our healthcare record system, in 2016 the Coast Guard established a formal nonmajor acquisition program to modernize the management of healthcare acquisition for approximately 50,000 Active Duty and Reserve members and improve the exchange of healthcare information with the Department of Defense, the Department of Veterans Affairs, and commercial care providers.

We initiated activities to explore several possible alternatives and are in close contact with DoD and Department of Veterans Affairs to ensure the new solution is interoperable with their healthcare records systems.

Last year, we initiated market research to gather data on cost, schedule, and performance capabilities, and potential solutions currently available in the commercial marketplace. We are evaluating the benefits and the risks associated with several approaches and are developing the best procurement strategy to expedite the acquisition.

The Coast Guard recognizes the urgency to support the health of our most valuable asset—our people—and our current governance framework ensures that we have the processes and policies in place to oversee our current electronic healthcare acquisition program.

We continue to incorporate the recommendations made as a result of the invaluable oversight of this subcommittee and the GAO. And I am committed, along with Admiral Schwartz, to the expeditious and responsible delivery of a high-quality electronic health record solution for our men and women in the field.

Thank you again for the subcommittee's staunch support and your oversight of Coast Guard programs and for the opportunity to testify today. I look forward to answering your questions.

Mr. HUNTER. Thank you, Admiral Haycock.

Now to Mr. Powner. You are recognized.

Mr. POWNER. Chairman Hunter, Ranking Member Garamendi, thank you for inviting GAO to testify on the Coast Guard's failed effort to acquire an electronic health record. This morning I will provide details of what went wrong with the acquisition and what needs to be done to manage this more appropriately in the future. This lookback is important to make sure that the Coast Guard corrects the management and governance flaws that led to about \$60 million being wasted.

This effort started in September 2010 and was to be a 5-year project and cost about \$14 million. Due to growing scope and mismanagement, the cost grew to about \$60 million before the project was terminated in October 2015 with nothing to show for it.

There is a long list of things that went wrong that are laid out in great detail in the report we are releasing today. The highlights are:

The project was behind schedule.

There were questions about whether the Coast Guard was using appropriate funding sources to pay for it.

Expected system capabilities were not being delivered.

The system had limited security features, which is alarming given the sensitivity of the data residing in these electronic health records.

The Coast Guard wasn't completely following its own processes to acquire a system. Examples include not involving users of the system and not testing it adequately.

Executives who should have been involved were not, as several governance boards were established to oversee this and they were simply not active.

I would like to highlight the words "not active." We at GAO have reported on failed IT acquisitions over the years and the message is usually that executive boards were not effective or not involved enough, not "not active."

Finally, post-cancellation, no equipment or software was delivered for reuse and the Coast Guard continued to pay millions to vendors after the cancellation to satisfy contractual commitments. In fact, our report highlights two payments scheduled for next month that collectively total more than \$5 million. Yes, nearly 2½ years after cancellation, we are still paying contractors.

Compounding the situation is the fact that 3 months after the October 2015 cancellation, the Coast Guard decommissioned its older existing legacy system because it was not complying with international medical coding requirements. This left the Coast Guard to predominantly use a paper process to maintain health records.

To its credit, the Coast Guard is attempting to use some DoD applications and workarounds to supplement its paper process. But let's be clear, using paper is inefficient and dangerous.

Coast Guard clinical staff reported major issues to us that include problems with incomplete records, issues with tracking medications, and challenges scheduling appointments.

The Coast Guard is planning a new electronic health record. A request for information went out in April 2017, but the Coast Guard has yet to determine its specific electronic health record solution.

Moving forward, we have five recommendations for the Coast Guard:

Number one, make sure managers and executives with the right IT background are involved with this acquisition. Most importantly, this includes the chief information officer.

Number two, executive governance needs to be active and frequent. This governance needs to be driven by the CIO and the witnesses here today.

Number three, project management disciplines need to be carried out. This would include implementing the appropriate cybersecurity measures and involving the user community extensively, since business process change will be significant to effectively deploy commercial products in this area.

Number four, the Coast Guard needs to consider adjustments or tailoring of its processes it uses to manage what it calls smaller or nonmajor acquisitions. Dollar thresholds alone shouldn't drive the rigor and attention projects get. Mission criticality should.

And finally, the Coast Guard needs to strongly consider the EHR solution that DoD and the Department of Veterans Affairs are pursuing.

Mr. Chairman, this concludes my statement. Thank you for your oversight of this important acquisition.

Mr. HUNTER. Thank you, Mr. Powner. And to the other witnesses, thank you very much.

I guess let us go with what you were saying. What was your last recommendation?

Mr. POWNER. The last recommendation is you really need to look at what DoD and Department of Veterans Affairs are doing. I mean, we made a bold decision for VA to go with the solution that DoD was using. And I understand competition in this industry.

Mr. HUNTER. But is the Coast Guard DoD? The Coast Guard is a military service, right? Why wouldn't you go with DoD in the first place? Why not be interchangeable with DoD? Why not save all that money and time and be efficient and use DoD's product?

Admirals.

Admiral SCHWARTZ. The Coast Guard is looking with great interest at what DoD is doing and what the Department of Veterans Affairs is doing with regards to their new electronic health record system.

Mr. HUNTER. But why would you not use that?

Admiral SCHWARTZ. So, sir, as a military service we certainly are looking at what they are doing with respect to the new MHS GENESIS product. And what we are doing is looking at what their lessons learned are.

Mr. HUNTER. But why would you not use that? Why would you not use what DoD is already doing?

Admiral SCHWARTZ. As part of the acquisition process, which I will yield to my colleague here, we are looking at various GOTS [Government off-the-shelf] and COTS [commercial off-the-shelf] solutions.

Mr. HUNTER. I understand that you are doing that. Why would you not use DoD's solution?

Admiral HAYCOCK. Mr. Chairman, I can't speak to something that happened that long ago.

Mr. HUNTER. No, now. Why would you not use DoD's solution now?

Admiral HAYCOCK. That is our—

Mr. HUNTER. It is a waste of money and time going to look at stuff when it exists right now. I don't think you would say that the Navy is less complicated than the Coast Guard, right, or the Army. It is a lot more complicated, and larger and more spread out, and they are able to do it. So why wouldn't you just use that?

Admiral HAYCOCK. As you know, Mr. Chairman, when you start getting into major acquisitions of great scope and complexity there is discipline that we have to put in the process, and that is what prevents us from getting into trouble.

We are going through that process. We have done an analysis of alternatives, which is looking at what exists out there for us to potential solutions.

One of those solutions is using a Federal service provider. That is the solution that we would like to go for and that is what we

are working with the Department of Veterans Affairs and DoD to make happen. We are in close conversation with them informally on probably a weekly basis and meeting with them formally on a monthly basis. We have been invited to be part of their executive steering group and we are participating in that.

So we are tracking down that direction, but we need to follow the discipline of the acquisition process or we will end up in messes like other programs have seen in the past for not doing it.

That is when gives me great confidence on eHRA [electronic health record acquisition] going forward, is that we have stood it up as a formal acquisition program and it is getting that discipline and the oversight. The very same people that oversee all of our major acquisitions, like ships and aircraft and such, they are providing the oversight for eHRA now, and that includes the chief information officer and every stakeholder and tech authority in the Coast Guard.

Mr. HUNTER. OK. I would highly encourage you guys to do what is easy and efficient and effective, especially when you have got really big services with lots of money doing it for you and you can just piggyback onto that.

Let me switch over. There is no code, there is no software, there is no code and no machinery, right?

Admiral SCHWARTZ. Sir, IHiS is considered a software as a service product. And so what we did was we contracted with various software companies and they produced, developed modules for our safety program, for our health program, for our work-life program. But because it is a software as a service, once we stopped paying for those services we don't have a final product to show.

Mr. HUNTER. So you didn't have any intellectual property?

Admiral SCHWARTZ. That is correct, sir.

Mr. HUNTER. Whose decision was it to cancel it?

Admiral HAYCOCK. I guess it was probably three-quarters of the way through 2015 the Executive Oversight Committee, their counsel was sought out by the project. The executives on that team heard the brief, saw the risks involved, and recommended that the Coast Guard, the Vice Commandant, cancel the program.

Mr. HUNTER. I think it is very strange that there is nothing, that you got \$60 million and you literally got nothing out of it.

Is that usual, Mr. Powner, I mean, to retain no intellectual property?

Mr. POWNER. You know, I think you can write contracts in a way where you do maintain some of—I understand the software as a service concept, but you can write that in a way that you have some reusability.

If you have nothing, that might even be more of a reason to go with what the Department of Veterans Affairs and DoD are already doing, because if we don't have anything to reuse—I agree with you on your comment about piggybacking on what is already there. And they are ahead of the game, so you can look at lessons learned and learn from that. That is what the Department of Veterans Affairs is doing with DoD right now.

And there are lessons learned on the business processes and the like. To me, that makes sense, to go that route, especially given the fact that we have nothing.

Mr. HUNTER. My last question is to stress this point. Is there anything that makes coastguardsmen different from any other servicemember besides what they do in their specialty? Is there anything special about being in the Coast Guard that would not allow you to be in the Department of Defense's health record system?

Admiral HAYCOCK. No, Mr. Chairman. We are a military service, so our Active Duty coastguardsmen are just like all the other Active Duty military.

I think some things that may play into it that make us a little unique is the size of our Service. So infrastructure is a little bit different, the types of patients that we see and that the Department of Veterans Affairs sees might be a little bit different. But for the most part there is nothing special there.

Mr. HUNTER. The Coast Guard has got a lot of missions that do a lot of totally different things. And I think what you are doing is complicating your own lives here. I mean, you can't have a core competency of everything.

With that, I would like to yield to the ranking member. You are recognized, Mr. Garamendi.

Mr. GARAMENDI. I think I have been through too many of these. Electronic health records are now standard in virtually every health system in the Nation. And every one of them have made mistakes and in most every system the first effort failed. But we have more than enough models in place so that this should not have happened. But it did.

My real issue is, who was the contractor? I was looking through the report and never a name of the contractor.

Admiral SCHWARTZ. Sir, there were numerous contractors that supported the IHiS effort.

Mr. GARAMENDI. Who are they?

Admiral SCHWARTZ. Sir, I don't have a list of the contractors with me today, but we certainly can make that list available to you.

Mr. GARAMENDI. Somebody ought to be accountable here. We are holding the Coast Guard accountable, but the contractor also screwed up. I want to know who screwed up. Who is the contractor that screwed up here?

Mr. Powner, do you know?

Mr. POWNER. We can get you a list of the contractors who were involved in that.

Mr. GARAMENDI. I am sorry, this whistling behind just wiped you out. Could you say that again?

Mr. POWNER. Yes, we can get you a list of the contractors involved.

I think you bring up a good point. I have testified in front of Congress on many failed acquisitions over the years. And is there mismanagement on the Government side? Yes. But there is also an obligation on the contractual side to work in partnership on this, and we need more of that going forward, clearly.

Mr. GARAMENDI. I am just willing to bet, without knowing who they are, I will bet they have screwed up before and I will bet we have hired the same folks that screwed up before to do another screwup.

Yes, I would like to know the name of the companies that failed to perform. That is the first issue.

The second issue was the question raised by the chairman, Mr. Hunter, and that is, the Department of Defense is in the process of developing an electronic medical record. And if I recall correctly, they finally decided, out of a fit of wisdom, that it would also be the same records that the Department of Veterans Affairs used. In other words, they were transferrable one to another.

That took about 10 years' fight between the two agencies, but I guess somewhere along the line both decided that an active member and reservist in the military, the Department of Defense, might at some time in the future become a veteran and that their medical records really ought to be available to the Department of Veterans Affairs.

Does the Coast Guard also see the wisdom of this transferability of the medical records from the Coast Guard to the Department of Veterans Affairs? Are you taking that into account?

Admiral SCHWARTZ. Absolutely, sir. And just to be clear, right now, even though we are on paper health records, we do transfer our paper health records to the Department of Veterans Affairs. It is through a system called the Health Artifact and Image Management Solution, which is the same system DoD uses right now. We digitize our paper health records when a member leaves the Service, and that record is uploaded into HAIMS and the Department of Veterans Affairs can extract the record from HAIMS.

Mr. GARAMENDI. So at least you are thinking about it with regard to paper. And you are going to do that with regard to the electronics if and when you ever get there?

Admiral SCHWARTZ. Absolutely, sir.

Mr. GARAMENDI. The chairman was pushing the point, I think correctly, that you ought to be using the same system as the Department of Defense. Are you contemplating doing that? It wasn't quite clear to me in the responses, Admirals, that you are or are not.

Admiral HAYCOCK. The alternatives analysis is——

Mr. GARAMENDI. Please really speak loud, this whistling behind us is most distracting.

Admiral HAYCOCK. So the alternatives analysis that we conducted, that is one of the preferred alternatives, and we are working through the details to make that happen.

Mr. GARAMENDI. And when do you expect to make a decision?

Admiral HAYCOCK. We are approaching Acquisition Decision Event 2A/2B, which probably doesn't mean much. But we have a major acquisition decision coming up here probably end of February.

Mr. GARAMENDI. I know of several clinics in California that have more than 50,000 lives in their clinics. They have established electronic medical records. I mean, some of this stuff is now off the shelf.

Mr. Powner, you have been at this a long time. You have found more than enough problems. Your recommendations in your report are rather general. Do you have specific recommendations? And is one of those recommendations——

Mr. POWNER. Yes. I would say the key recommendation, and I have seen this, you can have the best project management on these technology projects, but if you don't have executives that are accountable and breathing down the neck of project managers, that is what makes this stuff work, when you get executives involved.

Example, the U.S. Census Bureau, OK? Now we are going to spend \$3 billion more on the Census Bureau. What happened? Secretary Ross is now involved with the Census Bureau and they set up adequate governance.

The Coast Guard has a governance process in their policies, they just need to execute it. It starts with the admirals at this table, with the CIO, with the CFO, and they need to drive the delivery of this system.

Good governance, that is what actually works in Government, when you have the executives accountable and pushing hard to make sure we get deliveries, not only from the Government but from contractors too. You sit down with contractors, you demand the A team.

That is the stuff that has worked over the years, and I can give you positive examples, too, where it has worked.

Mr. GARAMENDI. I agree entirely.

So, Admirals, are you engaged?

Admiral HAYCOCK. Yes, Congressman. IHiS was kind of a watershed event, shook our foundations. It really caused us to kind of sit back on our heels and try to figure out what happened.

IHiS did not have the appropriate executive oversight. That is probably the biggest problem. There are other things that complicate IHiS, but they all lead to this failed oversight on our part.

So we have stood up a formal acquisition program for eHRa, and it has the right executives providing the oversight. Admiral Schwartz is a member of the EOC, the Executive Oversight Committee, our CIO is, and a host of others that have a stake in this.

So I assure you, we have the right executives breathing down the neck.

Mr. GARAMENDI. You just described everybody is responsible and therefore nobody is responsible. So which of the two of you are responsible?

Admiral HAYCOCK. I am responsible because I am the acquisition officer.

Mr. GARAMENDI. Admiral Schwartz.

Admiral SCHWARTZ. Sir, I am responsible for ensuring the requirements document is delivered to our acquisition officer to delineate what we need and what we want for an electronic health record system.

Mr. GARAMENDI. Isn't that readily available from a dozen different organizations that already have electronic medical records?

Admiral SCHWARTZ. We have completed the operational requirements document. We delivered it to the hands of our chief acquisition officer. And we are moving as quickly as we can to get this EHR out in the field.

Mr. GARAMENDI. Have you consulted with Mr. Powner on his recommendations?

Admiral SCHWARTZ. Sir, we have read the GAO's draft report and we have taken them absolutely to heart.

As Admiral Haycock mentioned, governance was a significant issue with IHiS. IHiS was stovepiped in the medical program. We did not involve the chief information officer. We did not involve the chief acquisition officer.

No more. As we move forward, we have this cross-directorate governance that includes the CIO, that includes the chief acquisition officer and others on the governance board.

Mr. GARAMENDI. You have developed an AOA?

Admiral HAYCOCK. An alternatives analysis, yes.

Mr. GARAMENDI. Have you developed one?

Admiral HAYCOCK. We have.

Mr. GARAMENDI. Have you presented that to the committee, us?

Admiral HAYCOCK. I don't—

Mr. GARAMENDI. Well, why don't you do so? We have seen AOAs on God knows how many things under Defense on the House Armed Services Committee. I would love to see your AOA.

Mr. Powner, have you reviewed the AOAs?

Mr. POWNER. No, I have not reviewed that in great detail.

Mr. GARAMENDI. Should you?

Mr. POWNER. Yes. But I would say you could eliminate the AOAs down to—as was mentioned here, this is a robust area when you look at commercial products. So I don't know why we would look at anything beyond commercial products.

And then I will narrow it further. Let's piggyback on DoD and the Department of Veterans Affairs. Let's make it simple. We are making it too complicated.

I understand we have to follow the process—

Mr. GARAMENDI. Admiral Schwartz, you heard what he said?

Admiral SCHWARTZ. Sir, as the chief medical officer, I absolutely would love to go with DoD and the Department of Veterans Affairs. I have provided my requirements. We worked very closely to look at what DoD was doing to ensure that the operational requirements documents that we provided to the acquisition officer was very similar to what the DoD system is.

Mr. GARAMENDI. I find it astounding that—I mean, this is so—this is not complicated. There are commercial applications out there. I know four clinics that in the last 3 years have purchased off-the-shelf electronic medical records that also allow them the opportunity to convert their previous paper records to electronic records, all done. It is off the shelf. And they have more lives than the Coast Guard has.

I guess one question is that the GAO comes in after there is a screwup. It seems to me that there ought to be an iterative process here.

Mr. Powner, you have got a lot more knowledge than either of the two admirals here about these kinds of things. This has been your life or at least you more recent life's work. Maybe you ought to quit GAO and become a consultant. But stay where you are, we need you there.

But it would seem to me that it would be worthwhile for the Coast Guard to consult with the GAO and to learn from their experiences. I know you have two different tasks.

Mr. POWNER. If I can add. So we do some postmortems at GAO on things that go wrong, but we also do a lot of work for the Con-

gress when acquisitions are in flight. And that is when it is most effective, working alongside. We can still maintain our independence and work alongside while acquisitions are in flight to ensure that governance and project management, contractor oversight, and all those things are occurring.

Mr. GARAMENDI. Well, given that, I have just requested an AOA—or the AOA. I would appreciate your review of the AOA, while it is in process. Postmortems are usually over dead and troubled projects. We can avoid that, I think, by working together here. I yield back.

Mr. HUNTER. I thank the gentleman.

One thing we looked at, and I don't know if you have heard of this, Mr. Powner, but it is called the Distributed Common Ground System, DCGS, for the Army. It is like \$4 billion they put into it.

It never worked. They had about 30 nice contractors that all did modules and they could all plug and play theoretically, but nothing. It didn't work, period.

And it was billions of dollars and it required the Chief of Staff of the Army now, General Milley, to kind of do what you are doing, Admiral Haycock, and taking a hard look at this, as a four-star. Because when you are spending billions of dollars or tens of millions of dollars for the Coast Guard, I mean, you have to make sure you have it right, especially with software.

It would be nice to be a software contractor in town here. I can do stuff for you and never give it to you and you will pay me.

Mr. GARAMENDI. I want to know who the contractor was.

Mr. HUNTER. I think it is absurd you are paying next month for this, even though the whole thing is over. But what is in the past is in the past. We don't want to beat on the Coast Guard too much right now. You have got things straightened up. And hopefully moving forward, Mr. Powner will have good things to say.

And again, I am of the mind to make you get on DoD's thing no matter what you think. We ought to just tell you to do it. You don't need to be going off and doing your own thing when it comes to healthcare.

I think that is not Mr. Garamendi and I or this committee micro-managing. It is saying you guys don't get to go off on your own and just use taxpayers' dollars because it is fun when you have the Department of Defense doing it.

So I think that is something we ought to look at, is just telling you what to do, especially in this case. I think that would be a smart thing for us to look at and see if that is even possible.

With that, thank you very much for being here. And hopefully we get this straight.

With that, the hearing is adjourned.

[Whereupon, at 11:36 a.m., the subcommittee was adjourned.]

STATEMENT OF
THE HONORABLE JOHN GARAMENDI
SUBCOMMITTEE ON COAST GUARD AND MARITIME TRANSPORTATION
"THE EXAMINATION OF REPORTS ON THE EL FARO MARINE CASUALTY AND COAST
GUARD'S ELECTRONIC HEALTH RECORDS SYSTEM"

JANUARY 30, 2018

Thank you, and good morning. We meet today to take up the somber matter of the tragic loss of the U.S. flag commercial Roll-on/Roll-off vessel, SS EL FARO, which was lost along with 33 crewmembers on October 1, 2015 – the worst maritime disaster affecting a U.S. flag oceangoing vessel since the loss of the SS MARINE ELECTRIC off the coast of Virginia in 1983. I would like to start my opening statement by entering their names for the record. It is in their memory, in honor of their service, and in hopes of preventing future loss of life, that we are here today.

I want to welcome our witnesses from the Coast Guard and from the National Transportation Safety Board who jointly conducted the two-year follow-on marine casualty investigation. We have much to learn and I appreciate your participation here this morning.

The destructive power of the ocean environment, especially an ocean whipped wild by hurricane force winds, is relentless, unpredictable, and coldly unforgiving. Men and women head out to

sea daily trusting that their vessels, their training, and their contemporary safety management systems will ensure a safe and uneventful voyage.

More often than we care to think, however, this does not happen. Consequently, we again are reminded under tragic circumstances that maritime safety can never be taken for granted.

We will hear about the several factors that contributed to the loss of the EL FARO and its crew – the horrendous sea state, structural deficiencies in the aged vessel, and the vessel's loss of propulsion, among others.

Perhaps most troubling to me were other factors, however, factors that point to a breakdown in our entire marine safety management paradigm, both on the vessel, and on shore in the management and inspection of the vessel.

Over thirty years ago, in the wake of the loss of the SS MARINE ELECTRIC, the Coast Guard dramatically changed its inspection and oversight procedures. At that time, the Marine Board of Investigation report noted that the American Bureau of Shipping (ABS) "cannot be considered impartial", and described its failure to notice the critical problems with the ship as negligent.

Additionally, the report noted, "the inexperience of the [Coast Guard] inspectors who went aboard the MARINE ELECTRIC, and their failure to recognize the safety hazards...raises doubt about the capabilities of the Coast Guard inspectors to enforce the laws and regulations in a satisfactory manner."

Yet here we are today, 35 years later, and we find a new Marine Board of Investigation report finding the very same faults in the two institutions upon which the entire U.S. maritime safety system depends for reliability, compliance, and accountability.

We need to find out exactly what went wrong, both within the organization of the Coast Guard, and outside of the Coast Guard, particularly in its oversight and growing reliance on the use of third party inspectors in its Alternate Compliance Program.

Moreover, this time, we will correct those problems by whatever means necessary to achieve that end. The men and women who go to sea for their livelihoods expect nothing less from us.

Thank you.

U. S. Department of
Homeland Security

United States
Coast Guard



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**REAR ADMIRAL JOHN P. NADEAU
ASSISTANT COMMANDANT FOR PREVENTION POLICY
LESSONS LEARNED FROM THE EL FARO MARINE CASUALTY
BEFORE THE HOUSE
SUBCOMMITTEE ON COAST GUARD AND MARINE TRANSPORTATION
JANUARY 30, 2018**

Good Afternoon Chairman Hunter, Ranking Member Garamendi, and distinguished members of the subcommittee. I am humbled to appear before you today to discuss the lessons learned from the EL FARO tragedy.

EL FARO MARINE CASUALTY: COMPREHENSIVE OVERVIEW AND BACKGROUND

On behalf of the U.S. Coast Guard, I would like to offer my sincere condolences to the family and friends of the victims aboard the EL FARO. Not only do I want to express my sympathies for their loss, but I also want to convey that the U.S. Coast Guard will keep this tragedy in the forefront of our minds as we strive to make enhancements to our marine safety program to help the maritime industry avoid future preventable tragedies.

The loss of the U.S. flagged cargo vessel EL FARO, along with its 33-member crew, ranks as one of the worst maritime disasters in U.S. history, and resulted in the highest death toll from a U.S. commercial vessel casualty in almost 40 years. At the time of the sinking, the EL FARO was on a U.S. domestic voyage with a full load of containers and roll-on roll-off cargo bound from Jacksonville, Florida to San Juan, Puerto Rico. As EL FARO departed port on September 29, 2015, a tropical weather system formed east of the Bahamas Islands and rapidly intensified in strength. The storm system evolved into Hurricane Joaquin and defied weather forecasts and standard Atlantic Basin hurricane tracking by traveling southwest. As various weather updates were received onboard EL FARO, the Master directed the ship southward of the normal route to San Juan.

The Master's southern deviation ultimately steered EL FARO almost directly towards the strengthening hurricane. As EL FARO began to encounter heavy seas and winds associated with the outer bands of Hurricane Joaquin, the vessel sustained a prolonged starboard list and began intermittently taking water into the interior of the ship. Shortly after 5:30 AM on the morning of October 1, 2015, flooding was identified in one of the vessel's large cargo holds. At the same time, EL FARO engineers were struggling to maintain propulsion as the list and motion of the vessel increased. After making a turn to shift the vessel's list to port in order to close an open scuttle, EL FARO lost propulsion and began drifting abeam to the hurricane force winds and seas. At approximately 7:00 AM, without propulsion and with uncontrolled flooding, the Master notified his company and signaled distress using EL FARO's satellite distress communication system. Shortly after signaling distress, the Master ordered the crew to abandon ship. The vessel, at the time, was near the eye of Hurricane Joaquin, which had strengthened to a Category 3 storm. Rescue assets began search operations, and included a U.S. Air National Guard hurricane tracking aircraft overflight of the vessel's last known position. After hurricane conditions subsided, the Coast Guard commenced additional search operations, with assistance from commercial assets contracted by the vessel's owner. The search located EL FARO debris and one deceased crewmember. No survivors were located during these search and rescue operations.

On 31 October 2015, a U.S. Navy surface asset contracted by the National Transportation Safety Board (NTSB), using side-scan sonar, located the main wreckage of EL FARO at a depth of over 15,000 feet below the surface of the ocean. EL FARO's voyage data recorder was successfully recovered from the debris field on 15 August 2016, and it contained 26-hours of bridge audio recordings as well as other critical navigation data that were used to help determine the circumstances leading up to this tragic accident.

Following the marine casualty, the Commandant of the U.S. Coast Guard convened an independent Marine Board of Investigation (MBI). The MBI was conducted with a wide transparency to their proceedings. All three public hearings, at which 76 witnesses testified over 30 days, were live streamed. The 10 hours of conversations captured by the Voyage Data Recorder were transcribed and published prior to the conclusion of the investigations conducted by the Coast Guard and NTSB. As a result, some vessel owners and operators, as well as the Coast Guard were able to apply lessons learned in near real time and improve the safety of their operations.

The MBI's Report of Investigation (ROI) was released to the public on October 1, 2017 and included 34 recommendations. The Commandant's Final Action Memorandum (FAM) on the report, including action taken by the Commandant on the MBI's recommendations, was released on December 19, 2017.

In the FAM, the Commandant emphasizes the need for a strong and enduring commitment at all levels of the safety framework – vessel owner/company, Recognized Organizations (ROs) and Authorized Classification Societies (ACS), and the Coast Guard. First, the company must commit to a safety culture by embracing its responsibilities under the International Safety Management (ISM) Code. Second, the ROs and ACS must fully and effectively perform their duties and responsibilities. Finally, the Coast Guard, must, and will, provide the final element of the safety framework with sustainable policy, oversight, and accountability.

MAJOR REPORT SUMMARIES

While many factors contributed to this marine casualty, by far the most prominent was the Master's decision to sail the ship in close proximity to a Category 3 hurricane. There were multiple opportunities to take alternate, safer routes as the storm approached. There was adequate information available regarding the threat posed by Hurricane Joaquin, despite the unusually unpredictable nature of the storm's path and intensity. There were warnings and recommendations from the mates on successive watches recommending the vessel's course be altered to avoid the storm, but these recommendations were not heeded. The combination of these actions and events placed the EL FARO in harm's way near the eye of the storm. In the case of the EL FARO, those conditions led to a chain of events, the effects of which were irreversible.

However, failures within the operating company to embrace a safety culture and fulfill their responsibilities under the ISM Code, coupled with the ACS's inability to uncover or resolve longstanding issues with the vessel, and finally, shortcomings by the Coast Guard to oversee and adequately monitor the classification society, led to a collapse of the safety framework under which vessels and mariners operate.

COAST GUARD ACTIONS RESULTING FROM THE EL FARO

The Final Action Memorandum includes 29 specific actions to address safety recommendations, 4 actions to address administrative recommendations, and 1 enforcement action. These actions include:

- Supplemental flag State guidance regarding the development, implementation, and verification of Safety Management Systems;
- Changes, updates, and improvements to Coast Guard management of the Alternate Compliance Program (ACP) and accountability of Authorized Classification Societies, including establishment of a Third Party Oversight National Center of Expertise;
- Potential regulatory actions related to high water alarms and open lifeboats;
- Overhaul and update of the training and certification of Coast Guard Marine Inspectors;
- Evaluation of mariner training institutions and the Coast Guard credentialing process;
- Engaging the International Maritime Organization (IMO) to address safety issues related to cargo holds and the securing of cargo;
- Discussions with the National Oceanic and Atmospheric Administration (NOAA) regarding improvements to its maritime weather forecasting products;
- Search and rescue (SAR) related equipment changes;
- Civil penalty action against Tote Services Incorporated (TSI) for potential violations.

CONCLUSION

The casualty of the EL FARO points to the need for a strong and enduring commitment from all elements of the safety framework: vessel owner, Authorized Class Society, and the Coast Guard. The lessons from this tragic event provide something for every maritime industry stakeholder to learn and improve upon. As the lead agency of the U.S. Flag Administration, the Coast Guard is ultimately responsible to monitor the performance of third party organizations entrusted with the safety of U.S. ships. The Coast Guard is committed to providing sustainable policy, oversight, and accountability both internally and externally.

Thank you for the opportunity to testify before you today and I look forward to answering your questions.

Question#:	I
Topic:	Marine Safety Program Enhancements
Hearing:	Examination of Reports on the El Faro Marine Casualty and Coast Guard's Acquisition of Electronic Health Records System
Primary:	The Honorable John Garamendi
Committee:	TRANSPORTATION (HOUSE)

Question: The Marine Board of Investigation report found that the Coast Guard's oversight and enforcement of marine safety requirements were contributing factors in the sinking of the EL FARO.

As the flag officer in charge of prevention policy, what specific actions do you intend to take to review, evaluate and re-tool and re-build the Coast Guard's marine safety program, especially vessel inspections?

Response: I have prioritized marine inspector training, reforms to third party oversight, and information management as three focus areas for improvement. I am commissioning a marine inspector training analysis to identify specialized training that our marine inspectors need and how best to deploy the training. This analysis will inform any potential new courses to ensure marine inspectors receive a training program that continues to build on their technical competence throughout their career. I am refocusing existing Headquarters resources to manage the third party oversight program. I chartered a team to make governance, policy, and accountability changes to our third party vessel inspection oversight functions. Finally, subject matter experts within staffs are working closely with Coast Guard information technology managers to address the information management capability needs to enable our Officers in Charge of Marine Inspections to best assess and manage risk within their fleets of responsibility.

Question: Back in 2010, the Coast Guard made an internal push to build out its Marine Safety Program, including increasing the budget for these activities and staffing up.

Compared to levels reached after the 2010 build-up, how do the present budget and personnel levels compare? Are your operations and activities under-resourced to meet the demands?

Response: In 2010, the Coast Guard's Marine Safety Enhancement Program identified gaps within Coast Guard's vessel compliance workforce. At the time, the Coast Guard grew and moved resources internally to address some, but not all of these gaps. Since then, the existing inspected vessel fleet has increased 4.2 percent and will grow another 45 percent with the addition of towing vessels in July 2018. Amidst this growth in capacity and complexity within the maritime industry, the Coast Guard is also managing additional operational requirements due to new mandates, updated international treaties, shifting business models within industry, and the growing complexity within the marine transportation system. Due to all these reasons, our modeling suggests that we do

Question#:	1
Topic:	Marine Safety Program Enhancements
Hearing:	Examination of Reports on the El Faro Marine Casualty and Coast Guard's Acquisition of Electronic Health Records System
Primary:	The Honorable John Garamendi
Committee:	TRANSPORTATION (HOUSE)

currently have a gap in workforce strength needed to accomplish our mandated activities and operations, and we will work to prioritize available resources to address that gap.

Question#:	2
Topic:	Assessment of ACP
Hearing:	Examination of Reports on the El Faro Marine Casualty and Coast Guard's Acquisition of Electronic Health Records System
Primary:	The Honorable John Garamendi
Committee:	TRANSPORTATION (HOUSE)

Question: The Marine Board of Investigation report, and quite specifically, the National Transportation Safety Board (NTSB)'s report, concluded that the Alternate Compliance Program (ACP) is not effective in ensuring that vessels meet the safety standards required under regulations, and further concluded that many vessels enrolled under ACP are likely to be operating in substandard conditions.

Do you agree with this criticism? Did the ACP system break down?

Response: The Coast Guard failed to properly execute oversight of the American Bureau of Shipping (ABS) on the El Faro. However, the ACP is not fundamentally flawed. Nearly all global flag administrations use a similar model. The Coast Guard is fully committed to improving the safety framework on which the ACP is built, most importantly by improving our oversight and accountability of third party organizations.

Question: Do you agree with the NTSB's recommendation that the Coast Guard conduct a complete review of the ACP program to assess its adequacy and effectiveness?

Response: Yes, the Coast Guard has assembled a team of experts and we are currently working to implement reforms to improve program effectiveness and oversight.

Question: Will the recommended actions in the Commandant's Final Action Memo restore accountability and transparency to the ACP Program?

Response: The Coast Guard is actively working to establish and monitor key performance indicators (KPIs) which will be used to hold companies, third party organizations, and the Coast Guard accountable. New policy on third party oversight will emphasize feedback from Officers in Charge of Marine Inspections to document any third parties' substandard performance and initiate follow-on audits by Coast Guard. The Coast Guard will then be able to effectively intervene. In cases of significant underperformance, the Coast Guard may limit or remove a third party's authority to act on behalf of the Coast Guard.

Question: Does the Coast Guard intend to review all Recognized Organizations who participate in the ACP to ensure transparency and accountability in their work?

Response: The Coast Guard will establish and monitor KPIs to ensure transparency and accountability of delegated functions performed by third party organizations on behalf of

Question#:	2
Topic:	Assessment of ACP
Hearing:	Examination of Reports on the El Faro Marine Casualty and Coast Guard's Acquisition of Electronic Health Records System
Primary:	The Honorable John Garamendi
Committee:	TRANSPORTATION (HOUSE)

the Coast Guard. Organizations that fail to meet performance standards will be subject to additional Coast Guard audits and scrutiny. If the Coast Guard observes a pattern of substandard performance, the ability of that organization to act on behalf of the Coast Guard may be revoked or reduced.

Question#:	3
Topic:	Final Action Memo
Hearing:	Examination of Reports on the El Faro Marine Casualty and Coast Guard's Acquisition of Electronic Health Records System
Primary:	The Honorable John Garamendi
Committee:	TRANSPORTATION (HOUSE)

Question: As you know, the Commandant issued his Final Action Memo in late December. That memo contained several recommendations that will require the Coast Guard to revise or issue new regulations, standards or guidance, and other recommendations that will spur on new training, require the installation of new systems, or increase information requirements.

Have you determined how many recommendations in the Final Action Memo will require the Coast Guard to initiate a formal rulemaking?

Response: Yes, the Coast Guard will pursue rulemaking for two of the recommendations:

- Safety Recommendation #1- High Water Alarms.
- Safety Recommendation #6 - Vessel Weight Change Tracking.

Other recommendations in the Final Action Memo will be addressed through policy addressing existing regulations.

Question: How many do you intend to address through guidance issued through a Navigation and Vessel Inspection Circular (NVIC)?

Response: The Coast Guard may use other policy mechanisms beside NVICs. (e.g. Policy Letter, Mission Management System (MMS) Work Instructions, Marine Safety and Information Bulletins (MSIBs), and Marine Safety Alerts). The Coast Guard plans to initiate policy or guidance as it relates the following:

- Safety Recommendation #2 - Ventilators and Other Hull Openings for Cargo Ships
- Safety Recommendation #4 - Indicators for Watertight Closures on Bridge Alarm Panels.
- Safety Recommendation #5 - Clarification of Flag State Expectations for SMS Implementation
- Safety Recommendation #8 - Review and Approval of Stability Software.
- Safety Recommendation #16 - Damage Control Information for Existing Cargo Vessels

Question#:	3
Topic:	Final Action Memo
Hearing:	Examination of Reports on the El Faro Marine Casualty and Coast Guard's Acquisition of Electronic Health Records System
Primary:	The Honorable John Garamendi
Committee:	TRANSPORTATION (HOUSE)

- Safety Recommendation #18 - Evaluation of Mariner Training Institutions and Coast Guard Merchant Mariner Credentialing Process.
- Safety Recommendation #21 - Coast Guard Oversight of ACSs that Conduct ACP Activities
- Safety Recommendation #24 - ACS Surveyor Performance and Interactions with OCMLs.
- Safety Recommendation #31 - Technical Review of Critical Propulsion System Components.

Question#:	4
Topic:	Proposed Revisions
Hearing:	Examination of Reports on the El Faro Marine Casualty and Coast Guard's Acquisition of Electronic Health Records System
Primary:	The Honorable John Garamendi
Committee:	TRANSPORTATION (HOUSE)

Question: Several of the Commandant's recommended actions and several actions proposed by the NTSB require the Coast Guard to propose revisions at the International Maritime Organization (IMO) which oversees both the Convention for the Safety of Life at Sea (SOLAS), and the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW). The IMO process can take years, and proposals tend to become more "watered down" and less stringent as they move along to adoption, if at all.

How does the Coast Guard intend to raise these proposals at the IMO? What realistic timetable are you looking at expect to see your proposals adopted in new international standards?

Response: The Commandant identified two recommendations for revisions to the SOLAS Convention. The Coast Guard is currently preparing proposals for submission to the IMO. Similarly, the Coast Guard is reviewing the recently released NTSB report to determine if their recommendations require additional IMO action, and will subsequently prepare proposals as appropriate. If accepted by the IMO members, any proposals for new or amended IMO regulations will take approximately four years to complete, depending on the complexity of the proposal. The Coast Guard will provide updates on our progress in this regard.

Question#:	5
Topic:	El Faro Conversion
Hearing:	Examination of Reports on the El Faro Marine Casualty and Coast Guard's Acquisition of Electronic Health Records System
Primary:	The Honorable John Garamendi
Committee:	TRANSPORTATION (HOUSE)

Question: As you know, the EL FARO underwent a conversion in 2005-2006 to convert the vessel to carry load-on/load-off containers. The NTSB in their report concluded that this conversion should have been considered a major conversion by the Coast Guard. If this had been the determination, it would have triggered, among other things, an upgrade to the vessels' lifesaving appliances.

What factors contributed to the Coast Guard not considering this conversion to be a major conversion of the EL FARO?

Response: The Coast Guard determined that the 2005-2006 conversion did not constitute a major conversion as defined in 46 USC 2101 (14a), because the proposed modifications did not meet any of the four legislative criteria. The original determination that the conversion was a major conversion used the volumetric measure of the container cargo as the basis for evaluating the vessel's cargo carrying capacity. However, cargo ship carrying capacity, in terms of weight, is more appropriately measured by the deadweight tonnage. Since the 2005-2006 modifications resulted in a relatively small reduction in deadweight tonnage, the modifications were not considered a major conversion and the original determination was reversed. When modifications constitute a major conversion, it is the Coast Guard's policy that the entire vessel be brought up to the standards in effect at the time of the conversion, where it is reasonable and practicable to do so.

Question: Does the Coast Guard intend to revisit or revise its criteria for determining when a conversion is a major conversion?

Response: Yes. As stated in the Commandant's Final Action Memo in response to Safety Recommendation #27, the Coast Guard will review policies and procedures for making and documenting major conversion determinations.

Question#:	6
Topic:	Lessons Learned
Hearing:	Examination of Reports on the El Faro Marine Casualty and Coast Guard's Acquisition of Electronic Health Records System
Primary:	The Honorable John Garamendi
Committee:	TRANSPORTATION (HOUSE)

Question: The GAO found the Coast Guard has done an ineffectual job of documenting the lessons learned from the aborted Integrated Health Information System (IHiS) acquisition to avoid repeating the same mistakes in the future.

What is the Coast Guard doing to document the lessons learned from this failed acquisition program?

Response: The Coast Guard Acquisition Directorate has a lessons learned database. The Coast Guard has compiled lessons learned from the discontinued IHiS project and the consolidated lessons are available to the acquisition community through the database.

Question: What are the lessons learned?

Response: The major lessons learned focus on the following areas:

- *Appropriate identification of Level 3 Acquisitions to assign an appropriate level of governance and management.
- *IT investments specifically need adequate acquisition Program/Project Management and governance oversight.
- *Assign a dedicated Contracting Officer and Contracting Integrated Project Team to support a holistic contract strategy.

Question#:	7
Topic:	Health Care Record Keeping
Hearing:	Examination of Reports on the El Faro Marine Casualty and Coast Guard's Acquisition of Electronic Health Records System
Primary:	The Honorable John Garamendi
Committee:	TRANSPORTATION (HOUSE)

Question: GAO reports that due to the cancelation of the IHIS project and decommissioning of two legacy electronic health record systems, the Coast Guard directed its clinics to revert to maintaining health records using a predominantly paper process. Suffice to say, this is woefully inefficient, increases difficulty in tracking vital medical information, increases errors in record keeping, and ultimately, could harm Coast Guard service members.

What steps have you taken to address these deficiencies to limit their harmful effect on Coast Guard health care and health care record keeping?

Response: The Coast Guard has issued guidance to field commands to ensure that the clinics and sickbay staff appropriately manage patients using paper-service treatment records. This guidance includes: ensuring health care personnel know how to file patient encounter documents, procedures to close out paper service treatment records, and the process to mail records to the Health, Safety and Work-Life Service Center Central Cell for digitizing and uploading into the Health Artifact Imaging Management System for VA use.

The Coast Guard supplements its current paper process by using various applications, such as (but not limited to):

- The Navy's Medical Readiness Reporting System to track immunizations, periodic health assessments, dental exams, dental status, and required physical exams.
- The Army's Aeromedical Electronic Resource Office electronic tracking system to document aviation physical exams and aero medical summaries.
- The Defense Enrollment Eligibility Reporting System to verify all authorized DOD and Coast Guard beneficiaries and employees.
- The Disease Reporting System Internet—a system that serves as the official repository for reportable medical events for the Coast Guard, Army, Navy, and Air Force.
- The Joint Legacy Viewer—an application that provides a read-only view of health information from DOD, VA, and private sector partners.
- Additionally, some Coast Guard providers have access to local DOD electronic systems (e.g. ALTHA) to review patient health encounter data, enter in referrals, and order labs and radiology.

Question#:	7
Topic:	Health Care Record Keeping
Hearing:	Examination of Reports on the El Faro Marine Casualty and Coast Guard's Acquisition of Electronic Health Records System
Primary:	The Honorable John Garamendi
Committee:	TRANSPORTATION (HOUSE)

Question: Can you please describe the alternative "work around" processes implemented by the Coast Guard to ameliorate these circumstances? When do you intend to begin phasing them out?

Response: Currently, the Coast Guard's clinical staff perform the following steps to process each paper health record as a "work around":

- Schedule an appointment for patient using Microsoft Outlook's calendar feature.
- Provide the patient with the required forms for completion upon his or her arrival.
- Verify that all required paper forms are complete and correct.
- Handwrite clinical notes in a paper health record during the appointment.
- Complete referrals on an internal referral form and fax the form to the external provider.
- Handwrite prescriptions.
- Review and initial all lab and x-ray reports before filing them in the paper health record.
- File forms in their assigned sequence within the health record.
- Store all paper health records in secure cabinets or other secure areas of the facility.
- Conduct an accuracy and completeness check of the health record upon notification that an individual will be transferred to another facility and correct any identified deficiencies.
- Mail patient's paper health record to a new facility if there is a permanent change of station, or provide the patient his or her health record in a sealed envelope

The Coast Guard will phase out these "work arounds" when the new electronic health record is acquired.

Question#:	8
Topic:	System Acquisition Oversight
Hearing:	Examination of Reports on the El Faro Marine Casualty and Coast Guard's Acquisition of Electronic Health Records System
Primary:	The Honorable John Garamendi
Committee:	TRANSPORTATION (HOUSE)

Question: The GAO found that the governance of the IHIS acquisition program was poor from start to finish which led to the expansion of scope, and escalation of total cost far beyond the initial \$14 million estimate.

Does the Coast Guard agree with GAO's recommendation that moving forward the Coast Guard needs to establish project governance boards with the required expertise and competence?

Response: The Coast Guard agrees with the GAO recommendation. The established governance boards that oversee Major and Non-Major Acquisitions are the Executive Oversight Council (EOC), which includes both the Chief Acquisition Officer (CAO) and Chief Information Officer (CIO), and the Non-Major Acquisition Oversight Council (NMAOC), which includes CAO and CIO representatives. The EOC currently governs the Electronic Health Record Acquisition (eHRa) Program. This is the same governance body that oversees major acquisitions such as the National Security Cutter (NSC), Offshore Patrol Cutter (OPC), Fast Response Cutter (FRC), and the Heavy Polar Icebreaker (HPIB).

Question: If not, why not, and how does the Coast Guard intend to provide capable and timely oversight to ensure accountability in decision- making?

Response: The Coast Guard does agree with GAO's recommendation and the established governance board, which is the Executive Oversight Council (EOC), will provide capable and timely oversight.

Question#:	9
Topic:	IT Professionals Involved
Hearing:	Examination of Reports on the El Faro Marine Casualty and Coast Guard's Acquisition of Electronic Health Records System
Primary:	The Honorable John Garamendi
Committee:	TRANSPORTATION (HOUSE)

Question: GAO reports that the Chief Information Office of the Coast Guard was not directly involved in the formation and execution of this acquisition project. GAO also reports that the program had few qualified Information Technology (IT) professionals involved.

Why the Coast Guard's Chief Information Officer was not directly involved in this acquisition?

Response: The Coast Guard's Chief Information Officer (CIO) was involved through the IT System Development Lifecycle which resided outside of the acquisition process. However these processes for acquisition management and information technology developed in parallel to each other without consistently intersecting. In order to prevent this in the future the Coast Guard has revised its acquisition processes, methodology and guidance to account for requisite programs below \$300M life cycle cost, and directly targeted CIO involvement at all levels of acquisition.

Question: What is the Coast Guard doing now to ensure that going forward the service has more than sufficient IT personnel to be able to manage and execute this acquisition in a responsible manner?

Response: Governance differences moving forward are threefold:

- 1) eHRA program is managed through the acquisition process that involves detailed documentation with
- 2) cross-directorate integrated program teams (IPTs), which includes CIO staff and
- 3) acquisition oversight of Coast Guard senior leadership composed of the Chief Acquisitions Officer, Chief Financial Officer, and the CIO.

Question#:	10
Topic:	Non-Major Acquisition Oversight
Hearing:	Examination of Reports on the El Faro Marine Casualty and Coast Guard's Acquisition of Electronic Health Records System
Primary:	The Honorable John Garamendi
Committee:	TRANSPORTATION (HOUSE)

Question: In statute and under the Coast Guard's acquisition manual, a major system acquisition must cost more than \$300 million. Major system acquisition projects have to adhere to a robust oversight process to ensure accountability in spending, adherence to requirements, and maintenance of timetables for deliveries. The Coast Guard estimated the IHiS acquisition initially to cost \$14 million; far below the level of a major system, and as such, was not subject to the same level of oversight as a major system.

In light of this failed acquisition, what reforms are the Coast Guard considering to implement to tighten up its oversight of non-major acquisition projects under the System Development Life Cycle (SDLC) Practice Manual?

Response: The Coast Guard is taking specific actions in order to provide better governance and oversight of non-major IT acquisition projects including disestablishing the System Development Life Cycle (SDLC) as an IT acquisition governance model and transitioning to using the DHS Acquisition Lifecycle Framework (ALF) and Systems Engineering Life Cycle (SELC) for all non-major acquisitions. This transition is in the process of being codified in policy through an update to the Non Major Acquisition Process Manual (COMDTINST M5000.11), and facilitated by the creation of an IT Program Management Office (PMO) and IT Resource Council (RC) at the Headquarters level.

Question: Does the Congress need to legislate to amend the Coast Guard's acquisition authorities to get this done, or can the Coast Guard do this under existing authority?

Response: No additional legislative authority is needed to establish policies to govern non-major acquisition programs. The Coast Guard has established a structured, disciplined process for the designation, management and oversight of non-major acquisitions. The Non-Major Acquisition Process (NMAP) Manual, COMDTINST M5000.11 (series), outlines roles and responsibilities for stakeholders across the Coast Guard, which is in line with requirements under Coast Guard and DHS acquisition policies, the Federal Acquisition Regulation (FAR), and federal law.

Question#:	11
Topic:	Payments to Vendors
Hearing:	Examination of Reports on the El Faro Marine Casualty and Coast Guard's Acquisition of Electronic Health Records System
Primary:	The Honorable John Garamendi
Committee:	TRANSPORTATION (HOUSE)

Question: It is my understanding that the Coast Guard cancelled this program in October 2015. GAO reports, however, that over the past two years the Coast Guard has continued to pay vendors. In fact, the Coast Guard paid vendors \$6.6 million between November 2017 and February 2018 to satisfy existing contractual obligations.

Why is the Coast Guard still paying any vendor associated with this failed acquisition?

Response: Validated and certified payments were made between November 2017 and February 2018 for the IHIS Program after the IHIS program was canceled in 2015. The reason that these payments took this amount of time is due to the very deliberate review process that the Coast Guard undertook to validate contractor invoices so that all IHIS payments to contractors that the Coast Guard made would be proper and accurate.

The first aspect of this review was to verify that the services and supplies for which payment was being considered was received while that specific contract was still in effect. After that verification, the Coast Guard validated what was received. The Coast Guard then had to adjudicate any differences between the contractor invoices and Coast Guard records, which is a normal part of the contract close-out process. This took time to adjudicate only then were proper and accurate payments made. Not all contractor invoices have been paid as of this date because the Coast Guard is following the above process to ensure proper payments.

Question#:	12
Topic:	Demand Proto-types
Hearing:	Examination of Reports on the El Faro Marine Casualty and Coast Guard's Acquisition of Electronic Health Records System
Primary:	The Honorable John Garamendi
Committee:	TRANSPORTATION (HOUSE)

Question: GAO reports that the IHiS system, which was developed from an off-the-shelf commercial product, was never field tested at any point. The system also had limited functionality and was incomplete. The Coast Guard's Office of Budget and Programs asserts that no equipment or software from the IHiS project could be reused for future efforts when the Coast Guard cancelled the project.

Why did the Coast Guard not demand from the contractor any hardware or software proto-types that were developed in this failed \$60 million acquisition?

Response: IHiS was a software-as-a-service project. That type of project denotes a software licensing and delivery model wherein software is licensed on a subscription basis and is centrally hosted. Thus, software was on demand and once the Coast Guard stopped paying for the service it was terminated.



Testimony of

The Honorable Earl F. Weener, Ph.D.
Member
National Transportation Safety Board

Before the

Subcommittee on Coast Guard and Maritime Transportation
Transportation & Infrastructure Committee
United States House of Representatives

— On —

Examination of Reports on the *El Faro* Marine Casualty and
Coast Guard's Electronic Health Records System

Washington, DC • January 30, 2018

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Transportation
Safety Board
An Independent Federal Agency

Good morning Chairman Hunter, Ranking Member Garamendi, and the Members of the Subcommittee. Thank you for inviting the National Transportation Safety Board (NTSB) to testify before you today. I am accompanied today by Brian Curtis, the Director of our Office of Marine Safety.

The NTSB is an independent federal agency charged by Congress with investigating every civil aviation accident in the United States and significant accidents in other modes of transportation—highway, rail, marine, and pipeline. We determine the probable cause of the accidents we investigate and we issue safety recommendations aimed at preventing future accidents. In addition, we conduct special transportation safety studies and coordinate the resources of the federal government and other organizations to assist victims and their family members who have been impacted by major transportation disasters.

This testimony will discuss our investigation into the October 1, 2015, sinking of the US-flagged cargo ship *El Faro*, a 40-year-old vessel owned by TOTE Maritime Puerto Rico and operated by TOTE Services, Inc. The ship sank in the Atlantic Ocean about 40 nautical miles northeast of Acklins and Crooked Island, Bahamas, during Hurricane Joaquin, claiming the lives of all 33 crew members (**Figure 1**). On December 12, 2017, following a 26-month investigation, we determined the probable cause of the sinking and made 53 safety recommendations.

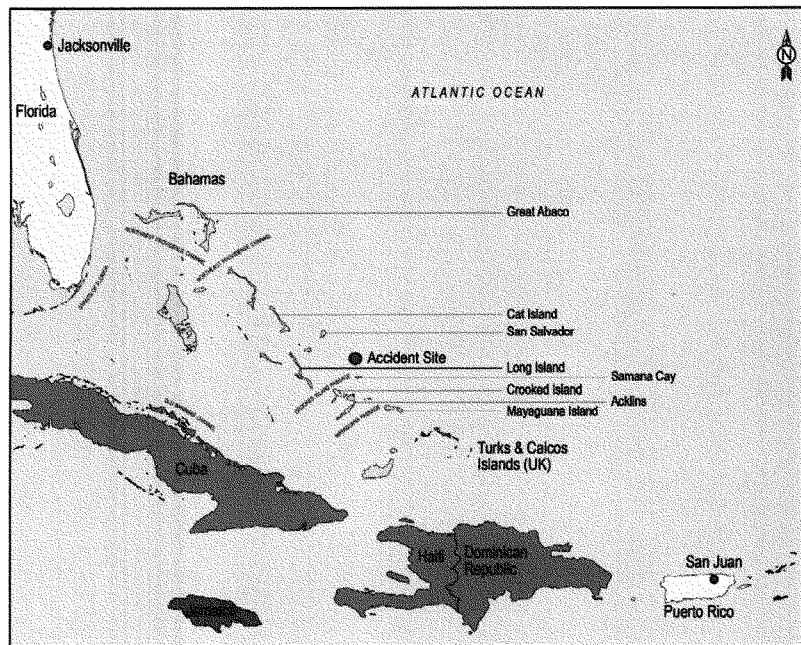


Figure 1. Accident location in the Atlantic Ocean near Acklins and Crooked Island, Bahamas.

The Investigation of the Sinking of *El Faro*

The sinking was investigated jointly by the US Coast Guard and the NTSB, with the NTSB as the lead investigative agency. The Coast Guard convened a Marine Board of Investigation, holding three public hearings, in which we fully participated. In addition, because the sunken *El Faro* could not be physically investigated (although many thousands of images were gathered during the underwater searches), our investigators visited *El Faro*'s sister ship, *El Yunque*, to observe and document its structure and equipment. Our investigators also gathered information by interviewing former and off-duty crewmembers, the crew's family members and friends, TOTE officials, industry representatives, Coast Guard officers, and others. Additional firsthand information about *El Faro* came from photographs and written records collected by Maine Maritime Academy cadets who had sailed on the vessel during the summer of 2015 as part of the school's cadet shipping program. Finally, recovering *El Faro*'s voyage data recorder (VDR) was critical to determining the probable cause of its sinking.¹

Four days after the sinking, the NTSB, working with the US Navy, began planning an effort to locate the *El Faro* wreckage and retrieve the VDR capsule. On October 31, 2015, the Navy ship *Apache* found *El Faro*'s hull on the seabed 15,400 feet below the surface of the ocean, but the VDR was not located. On April 26, 2016, the research vessel *Atlantis*, which was sent to the wreckage area by the National Science Foundation and the Woods Hole Oceanographic Institution, located the VDR capsule, but investigators determined that it could not be recovered at that time. Ten months after the accident, in August 2016, the Navy ship *Apache* returned to the site with a remotely operated vehicle, CURV-21, and retrieved the capsule from a depth of 15,250 feet. After the *Apache* returned to port on August 12, investigators transported the capsule to NTSB headquarters, where over 26 hours of parametric data and audio files were accessed.

We recovered audio of conversations and ambient sounds from the ship's bridge that began at 5:36 a.m. on September 30 and continued until the *El Faro* sank. This data, as well as parametric data from the VDR such as the ship's heading and speed over ground, provided information regarding the captain's and crew's conversations and actions throughout the voyage, the weather information available to them, and the ship's performance as it sailed into the storm.

We determined that the probable cause of *El Faro*'s sinking and the subsequent loss all 33 aboard was the captain's insufficient action to avoid Hurricane Joaquin, his failure to use the most current weather information, and his late decision to muster the crew. Contributing to the sinking was ineffective bridge resource management (BRM) on board *El Faro*, which included the captain's failure to adequately consider officers' suggestions. Also contributing to the sinking was the inadequacy of both TOTE's oversight and its safety management system. Further contributing factors were flooding in a cargo hold from an undetected open watertight scuttle and damaged seawater piping; loss of propulsion due to low lube oil pressure to the main engine resulting from a sustained list; and subsequent downflooding through unsecured ventilation closures to the cargo holds. Also contributing to the vessel's loss was the lack of an approved damage control plan that

¹ Organizations assisting in the VDR recovery included Department of the Navy, Supervisor of Salvage and Diving and Military Sealift Command; US Coast Guard; American Bureau of Shipping; National Oceanic and Atmospheric Administration; National Science Foundation; Woods Hole Oceanographic Institution; TOTE Services, Inc.; and University of Rhode Island, Inner Space Center.

would have helped the crew recognize the severity of the vessel's condition and guided their response to the emergency. Contributing to the loss of life was the lack of appropriate survival craft for the conditions.

The Accident Voyage

On September 29, 2015, at 9:48 p.m., *El Faro* and its 33 crewmembers departed its homeport in Jacksonville, Florida, on a 1,100-nautical-mile planned voyage to San Juan, Puerto Rico. Carrying 11,046 long tons of cargo, the ship was slated to arrive in the early morning hours of October 2. However, the ship sailed directly into the path of Hurricane Joaquin, a Category 3 storm that reached Category 4 strength shortly after the sinking at approximately 8:00 a.m. on October 1.

Approximately 3 hours before *El Faro* set sail on September 29, the National Hurricane Center (NHC) issued the first marine hurricane warning for Joaquin for a large area of the Atlantic east of the Bahamas; however, we determined that the captain's decision to depart Jacksonville was reasonable, considering the number of options he could employ to avoid the storm. As they tracked the storm the next day, the captain and chief mate diverted course to the south to try to distance themselves from the storm. However, as it continued to intensify, Joaquin also tracked further south than predicted.

The crew onboard *El Faro* relied on two primary sources of weather information to remain aware of Joaquin's changing position, forecast intensity, and forecast track: Inmarsat-C SafetyNET (SAT-C) and the Bon Voyage System (BVS). These sources used different methods and formats to deliver weather guidance. SAT-C provided text broadcasts of NHC weather products, which were delivered to the vessel's bridge. The most current information on Joaquin's position and forecast track and intensity SAT-C delivered (with limited delay) was the NHC's tropical cyclone forecast/advisory, which is issued four times a day for active tropical cyclones. Based on the VDR audio, there were five instances in which the SAT-C terminal on *El Faro*'s bridge likely received a tropical cyclone forecast/advisory between 6:38 a.m. on September 30 and 4:47 a.m. on October 1.

BVS is a software program that provides graphic depictions of weather information via e-mail or broadband. BVS weather files were e-mailed to *El Faro*'s captain, who primarily relied on this information for storm location and forecast track. Seven BVS files were e-mailed to *El Faro* during the accident voyage. At the times the BVS weather files were e-mailed, the storm location and forecast track were not current with the information then available through SAT-C; rather, BVS provided a storm position and forecast track 6 hours behind SAT-C. BVS also sends updates with current forecasts if a user specifically requests them, but during the accident voyage, *El Faro* did not request any such updates.

Figure 2 shows *El Faro*'s position at 2:30 p.m. on September 30, in relation to the storm's location and forecast tracks from SAT-C and BVS received that morning, as well as the NHC's poststorm best-track analysis of actual storm location. At 4:54 p.m., a SAT-C advisory received on the bridge indicated that the storm was moving further southwest. An updated BVS update was available for download at about 5:00 p.m., but it was consistent with the forecast that had been sent through SAT-C at 11:00 a.m.



Figure 2. Location of *El Faro* in relation to available weather forecasts and poststorm analysis at 2:30 p.m. on September 30.

At around 7:00 p.m., the captain adjusted the course slightly south (**Figure 3**). At this point, the ship was about 180 nautical miles (nm) northwest of the center of Joaquin. The captain left the bridge at approximately 8:20 p.m. and was not detected on the bridge by the VDR until 4:09 a.m. on October 1.



Figure 3. *El Faro*'s location, depicting the course change to the south, in relation to its prior course, available weather forecasts, and poststorm analysis at 7:00 p.m. on September 30.

At 10:53 p.m., a SAT-C advisory received on the bridge indicated that the storm was centered about 120 nm southeast of *El Faro*'s position and was moving southwest at 5 knots. Maximum sustained winds were 100 knots, with gusts to 120 knots. At 11:05 p.m., the third mate called the captain from the bridge telephone to notify him of the SAT-C advisory. At 11:13 p.m., the third mate called the captain again and suggested diverting to the south, noting that at 4:00 a.m. on October 1, they would be 22 miles from the center of the storm (**Figure 4**). This information did not cause the captain to authorize a course change. Later, the third mate told the able seaman on watch that the captain thought they would be south of the storm.



Figure 4. *El Faro*'s location, depicting the current course and expected position, available weather forecasts, and poststorm analysis at 11:13 p.m. on September 30.

At 1:20 a.m., the second mate, who had taken over watch duties, called the captain in his quarters to suggest they alter the course south at 2:00 a.m. According to the VDR, the second mate indicated that the captain told her to maintain the current course. At 1:31 a.m., the NHC issued an intermediate advisory that indicated that Joaquin had moved southwest over the past 3 hours. Intermediate advisories were not transmitted via SAT-C, and *El Faro* did not receive them. Intermediate advisories could have been obtained from the National Weather Service via an FTPmail service, but there is no evidence that the crew attempted to do so.

At 4:09 a.m., the captain arrived back on the bridge, and at 4:45 a.m., he downloaded a BVS weather file that had been sent at 11:04 p.m. the night before. Joaquin's position, forecast track, and intensity given in the file were consistent with the data in the advisory that had been delivered to the bridge via SAT-C almost 12 hours before, at 4:54 p.m. the previous afternoon. At 4:46 a.m., *El Faro*'s SAT-C terminal received an advisory indicating that *El Faro* was 11 nm northwest of the storm center (**Figure 5**).

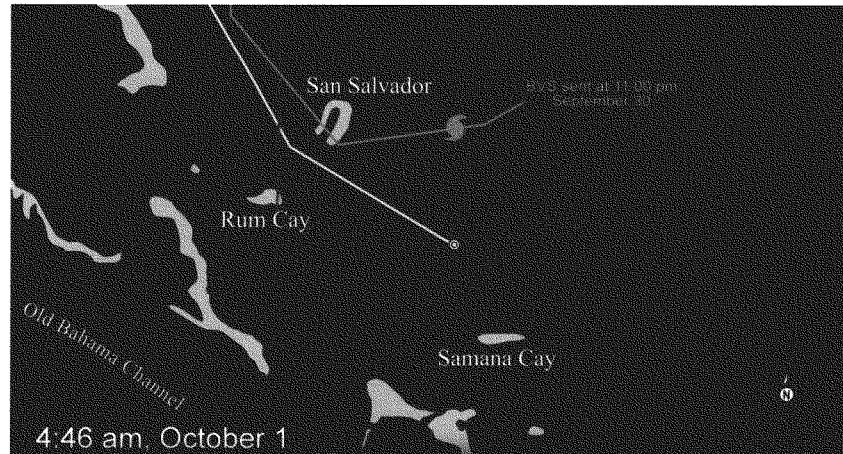


Figure 5. *El Faro*'s location in relation to available weather forecasts and poststorm analysis at 4:46 a.m. on October 1.

For the next hour, the captain ordered actions to address the ship's starboard list, which was caused by increasing wind on the vessel. At 5:43 a.m., the captain received a report of water in cargo hold 3, thought to be coming from an open deck hatch (scuttle) on the second deck, which allowed downflooding through the ship's watertight envelope. The crew did not know when or how the scuttle opened, as there was no open/close indicator at the bridge or other staffed location.

Around the time that he was informed of the flooding in hold 3, the captain was heard on the VDR indicating that cars were loose. He was likely referring to automobiles that had broken free from their lashings, as the automobile-lashing arrangement did not meet the requirements of the vessel's approved cargo-securing manual, making automobiles more likely to shift from vessel motion in heavy weather. The introduction of water to cargo hold 3, combined with the vessel's motion, led to some of the lashings failing and automobiles becoming unsecured.

The ship's list prevented the chief mate from accessing the scuttle, and the chief engineer also reported the list was adversely affecting machinery oil levels in the engine room. The captain ordered a turn to port to correct the list so as to re-establish machinery oil levels and allow the chief mate to access the scuttle area in the flooding cargo hold. The chief mate was able to access and close the scuttle; however, hold 3 continued to take on water, despite the bilge pumps continuously running. The ship continued to lose speed, and at 6:16 a.m., the engine room reported the vessel had lost propulsion. The port list, coupled with the vessel's motion, most likely caused air to enter the bellmouth of the suction pipe to the lube oil service pump, which resulted in a loss of oil pressure that caused the main engine to shut down. The level of lube oil in the main engine sump was not maintained in accordance with the vessel's operations manual, which increased the propulsion system's susceptibility to loss of oil pressure if the ship was listing. Once propulsion was lost, *El Faro* was pushed sideways by the wind and waves.

We found that all the watertight and weathertight ventilation closures to the cargo holds most likely remained open throughout the sinking sequence. As a condition of carriage, *El Faro*'s certificate of inspection required that for each cargo hold, at least one air supply fan was to be operated, and natural exhaust ventilation openings were to remain open under way at sea when transporting vehicles with fuel tanks. Because *El Faro* transported vehicles on the accident voyage that had fuel tanks, the ventilation ducts were required to remain open. The loss of propulsion combined with the heavy flooding and heel would have resulted in downflooding through the cargo hold ventilation openings. Analysis found that the ventilation openings for cargo hold 2A would have intermittently submerged due to flooding in hold 3 plus windheel, waves, and roll motion.

The captain called TOTE's designated person on shore at 7:06 a.m. to advise of the ship's situation, and at 7:12 a.m., he ordered the second mate to send a distress message. The Coast Guard's rescue coordination center in Norfolk, Virginia, received an alert at about 7:15 a.m. At 7:14 a.m., the chief mate informed the captain that the water levels were rising in the cargo hold and that the chief engineer had reported that the fire main, which was fed by seawater piping below the waterline, was ruptured, allowing seawater to rush into the number 3 cargo hold. It is likely that the seawater piping to the vessel's emergency fire pump in cargo hold 3 was inadequately protected from impact and was struck by one or more automobiles that had broken free of their lashings. Impact damage to this seawater piping in cargo hold 3 most likely led to flooding in the hold, which significantly compromised the vessel's stability. The rate of flooding in cargo hold 3 exceeded the bilge pumps' capacity to lower the water level in the hold. At 7:16 a.m., the bilge alarm sounded for hold 2A, indicating that floodwater had entered the hold.

At 7:27 a.m., the captain rang the ship's general alarm, and 1 minute later, the chief mate gave a radio command for the crew to muster on the starboard side of the ship. At 7:29 a.m., the captain ordered abandon ship, and 2 minutes later, he ordered the liferafts thrown overboard and the crew to enter them. The VDR ceased recording at 7:39 a.m., with the captain and able seaman still on the bridge.

A transmission from *El Faro*'s emergency position indicating radio beacon (EPIRB), which had been detected by geostationary satellite at 7:36 a.m., was e-mailed to the Coast Guard. The transmission was forwarded as an "unlocated first alert" because *El Faro*'s EPIRB was not equipped with a GPS beacon. No further communications were received by either the Coast Guard or TOTE. *El Faro*'s last known position, according to VDR data, was 20 nm north of Samana Cay, about 17 nm north of Joaquin's center.

Safety Issues

Our investigation into the sinking identified several major safety issues, including the captain's actions, currency of weather information, bridge team management, company oversight, damage control plans, and survival craft suitability.

The probable cause of sinking reflects the captain's decision-making and actions that put *El Faro* and its crew in peril. The captain did not divert to safer routes to avoid Joaquin, failing to heed the suggestions of the ship's junior officers to alter the course after they determined that

El Faro was headed into the storm. We determined that *El Faro* was receiving sufficient weather information for the captain to make appropriate decisions regarding the vessel's route; however, although up-to-date weather information was available, the captain did not use the most current weather information for decision-making.² The captain should have returned to the bridge after the second and third mates called him to gain a better awareness of the changing weather situation. In addition, had the deck officers more assertively stated their concerns, the captain's situational awareness might have been improved. Both the captain's inadequate regard for the crew's suggestions and the crew's inadequate assertiveness in stating their concerns to the captain demonstrate that the concepts of BRM were not implemented onboard *El Faro*.

BRM is a process by which bridge crews use all available resources and act efficiently and as a team to safely operate a ship. Training in BRM encourages junior officers to put forth their opinions and, when safety is a concern, to challenge their superior officers. Senior officers are, in turn, trained to be open to gathering feedback from the bridge team. All members of *El Faro*'s bridge team except the captain completed BRM training in 2013. The company was not required to send crewmembers to BRM training, and the Coast Guard does not require recurrent BRM training. TOTE's failure to ensure that BRM was implemented contributed to *El Faro*'s sinking. As a result, we made several recommendations to promote more effective BRM, including recommending that the Coast Guard require recurring BRM training for all deck officers when renewing their credentials.

The captain's actions led the ship into the middle of the storm, but the *El Faro* was also imperiled by a failure to maintain the ship's watertight integrity. Seawater entered cargo hold 3 through an undetected open scuttle, contributing to automobiles becoming unsecured and striking an inadequately protected emergency fire pump. The high rate of flooding contributed to further flooding susceptibility from water entering cargo ventilation openings. As a result, we recommended that the Coast Guard and the International Association of Classification Societies take action to provide that all watertight access doors and access hatch covers normally closed at sea be equipped with open/close indicators both on the bridge and locally; provide that seawater supply piping below the waterline in all cargo holds be protected from impact; and improve damage-control plans with better information and greater consideration of openings that lead to downflooding.

TOTE's safety management system was also inadequate and did not provide the officers and crew with the necessary procedures to ensure safe passage, watertight integrity, heavy-weather preparations, and emergency response during heavy-weather conditions. The company did not have an effective training program for the use of damage stability assessments, heavy-weather operations, or the use of the ship's weather information software. The company did not ensure that *El Faro* had a properly functioning anemometer, which deprived the captain of a vital tool for understanding his ship's position relative to the storm. The company did not monitor *El Faro*'s

² In the course of this investigation, we found that improvements need to be made to the tropical cyclone information that is available to mariners, and that a new emphasis on improving hurricane forecasts is warranted. On June 20, 2017, we adopted 10 recommendations to the National Oceanic and Atmospheric Administration, the National Weather Service, and the Coast Guard (National Transportation Safety Board, *Tropical Cyclone Information for Mariners*, Rpt. No. MSR-17/02 [Washington, DC: NTSB, 2017]).

position relative to the storm and did not provide the captain with support for storm avoidance and heavy-weather preparations during the accident voyage. The company's lack of oversight in critical aspects of safety management, including gaps in training for shipboard operations in severe weather, denoted a weak safety culture in the company and contributed to *El Faro* sinking. As a result, we recommended that TOTE conduct an external, independent audit of its entire safety management system to ensure compliance with the International Safety Management code and to correct noted deficiencies.

Finally, the captain's decision to muster the crew and abandon ship was late and may have reduced the crew's chances of survival. The severe weather, combined with *El Faro*'s list, made it unlikely that the liferafts or lifeboats could be launched manually or boarded by crewmembers once in the water, and they would not have provided adequate protection even if they had been launched. Open lifeboats, such as those *El Faro* carried, are not allowed on newly built vessels. *El Faro* was inspected and surveyed in accordance with the regulations applicable to its delivery date of January 1975. A vessel is surveyed under the same regulations as long as it is in service or until it undergoes a major modification; in the latter case, the vessel must comply with the requirements current at the time of modification as far as is reasonable and practicable. In 1993, *El Faro*, then named *Northern Lights*, began a major modification, but the lifeboats were not required to be upgraded at that time. The vessel was again substantially modified in 2005–2006 to carry load-on/load-off containers, but the Coast Guard did not classify this change as a major modification. We concluded that the 2005–2006 conversion should have been designated a major modification, which may have required the vessel to meet newer safety standards for lifeboats.

Survivability would increase if open lifeboats on all vessels remaining in service were replaced with enclosed lifeboats that adhered to the latest safety standards, and if new cargo vessels were equipped with stern-launched freefall lifeboats, where practical. We are recommending that the Coast Guard require that open lifeboats on all US-inspected vessels be replaced with enclosed lifeboats that meet current regulatory standards.

Conclusion

As with all of our investigations, our aim is to learn from this tragedy to improve safety for current and future generations of mariners. There were many factors that contributed to *El Faro* sinking, and there are many lessons to learn.

We wish to thank the US Coast Guard, the Department of the Navy, the National Science Foundation, Woods Hole Oceanographic Institution, and other organizations for their tremendous support in recovering *El Faro*'s recorder.

Thank you again for the opportunity to testify, and I am happy to take your questions.

**“Examination of Reports on the El Faro Marine Casualty and
Coast Guard's Acquisition of Electronic Health Records System”
Subcommittee on Coast Guard and Maritime Transportation Hearing
Tuesday, January 30, 2017, 10:00 a.m.
Washington, D.C.**

Responses to Questions for the Record from NTSB

Submitted on behalf of Congressman John Garamendi (CA-03)

Late last year the Commandant of the Coast Guard released his Final Action Memo based on the record and final report of the Marine Board of Investigation. The memo outlines 31 safety recommendations, four administrative recommendations, and one enforcement action.

1. What are your thoughts on this memo? Does the Commandant go far enough?

We look forward to the timely implementation of recommendations in the US Coast Guard's (USCG's) *El Faro* Report of Investigation (ROI). In the Commandant's Final Action Memo (FAM), the Commandant concurs, or concurs with the intent, of nearly all of the ROI's 31 recommendations. We believe the USCG's ROI is a comprehensive product. The ROI recommendations are closely aligned with our 53 *El Faro* report recommendations, and we feel that these recommendations, in aggregate, will improve safety in the maritime industry once implemented.

2. In your opinion as a National Transportation Safety Board (NTSB) board member, what was missed that should have included?

We believe the ROI and the Commandant's FAM are comprehensive and thorough. We worked jointly with the USCG to identify and collect factual documentation of *El Faro*'s sinking. Once the factual information was collected, our agencies worked independently to develop our reports and analysis of the many issue areas surrounding the accident. We did not find any issue areas were overlooked in the ROI or the FAM.

It appears from both reports that there was a substantial breakdown in the marine safety management systems aboard the EL FARO, from bridge management to inadequate lifesaving equipment. In fact, the NTSB concluded that the vessel operator, TOTE Services, Inc. “lacked oversight in critical aspects of safety management, including gaps in training for shipboard operations in severe weather, denoted a weak safety culture in the company.”

3. Comparing this marine casualty to other marine casualties affecting other vessels that the NTSB has investigated, did you encounter any similarities in the deficiencies found in the different vessels' safety management systems?

We examine safety management system (SMS) implementation in each case where a system is required. We have long advocated for this approach and seen improvements in operations where an SMS is successfully applied. For example, the Staten Island Ferry system implemented a comprehensive SMS following the 2003 *Andrew J. Barberi* accident. We revisited New York several years later following an engine casualty and noted the overhaul and positive improvements in that organization's management.

In that case and in other instances, such as the *Costa Concordia* casualty, the success of an SMS or of bridge resource management (BRM) is not defined by its mere existence, but rather by management's commitment to its complete and thorough adherence by all levels of personnel ashore and afloat. The system needs to become part of the company's culture, and not just a paper bureaucracy.

The similarities we have found in SMS deficiencies relate to companies having a paper system and then relying upon the USCG, classification societies, or their officers and crews to make it work. Successful SMS systems need solid structures to identify risk, create procedures to mitigate it, audit functions to check the system's performance, and an unwavering management commitment to make safety a part of the company's culture.

4. In your opinion, was TOTE Services' apparent lackadaisical attention to marine safety onboard EL FARO before and during this event unusual, or does it more accurately reflect the modus operandi of other U.S. flag carriers?

Unfortunately, industry often responds to risk after accidents. For example, after our *Exxon Valdez* accident report and subsequent legislation, the oil transport sector implemented rigorous measures and early versions of SMS and BRM. The cruise ship industry also responded *after* several serious cruise ship accidents. SMS and BRM improvements are clear in the reduced number of accidents in those industries. History has proven that active measures are cost effective and good business practices. The remaining cargo and other maritime sectors now have this opportunity to ensure that important areas of risk to their operations are addressed before an accident occurs.

We do not believe that one company's failure indicates a wider failure among US carriers in general. However, the US fleet is shrinking, so the number of accidents may not be an accurate predictor of SMS or BRM health. We will continue to observe and evaluate the effectiveness of these programs in all accidents where they are a factor.

5. Can this breakdown be addressed by revising and strengthening training and credentialing standards alone, or does more need to be done?

We have made recommendations to TOTE pertaining to its SMS, as well as to the USCG and ABS to improve credentialing and training to address the safety issues we found in the *El Faro* accident and to develop requirements for periodic refresher training. We have long advocated for BRM and SMS to be required where applicable.

Companies know their operations best. SMS and BRM can only be improved when companies make safety a priority and invest in rigorous company auditing, vessel tracking, and personnel training, instead of relying solely on flag or class to make their systems work better. Without such a safety culture, continuous improvement and risk mitigation cannot be achieved.

The NTSB and Coast Guard agreed that the lifesaving equipment onboard the EL FARO, especially the open lifeboats, were inadequate to useless in the face of the conditions.

6. In the opinion of the NTSB, should all U.S. flag oceangoing cargo vessels regardless of age be required to install fully enclosed lifeboats that adhere to all safety standards?

One ROI recommendation of particular interest to us requests that the Commandant “eliminate open top gravity launched lifeboats for all oceangoing ships in the US commercial fleet.” The Commandant concurred with the “intent” of this recommendation, but stopped short of strongly endorsing the ROI’s language to initiate a legislative change proposal and direct a regulatory initiative to do so, instead supporting proposals from vessel owners and operators.

In our *El Faro* report, we issued a recommendation to “Require that open lifeboats on all US-inspected vessels be replaced with enclosed lifeboats that meet current regulatory standards and freefall lifeboats, where practicable,” regardless of a vessel’s age. We feel that implementing this recommendation will improve survivability if a vessel must be evacuated, and we encourage the USCG to act favorably on this recommendation.

7. What about other lifesaving appliances or features? Should it be mandatory for vessel owners/operators to retrofit and upgrade to these new systems?

Our *El Faro* report contains two recommendations to the USCG related to regulatory improvements and technological advances regarding lifesaving appliances on US-inspected vessels.

The first recommends that the USCG “At regular intervals, not to exceed 20 years, review all lifesaving appliances on inspected vessels that are required by Title 46 *Code of Federal Regulations* Part 199, and require compliance with

current standards.” Advances in lifesaving appliances increase crewmember safety and survivability. Those advancements are incorporated in newer standards, such as those for enclosed lifeboats. All vessel crews should be afforded modern lifesaving equipment that complies with current standards.

Second, our report recommends that the USCG require all personnel employed on vessels in coastal, Great Lakes, and ocean service to be provided with a personal locator beacon. The USCG's ROI also contains a similarly worded recommendation. These small, portable units operate much like EPIRBs; they are manually activated, relatively inexpensive, and contain a homing beacon to help locate a person in need of rescue. A personal locator beacon can be assigned to crewmembers in the same manner as other safety gear, such as lifejackets and immersion suits. Given the wide availability and relatively low cost of personal locator beacons, we believe that these small portable units can enhance a person's chances of survival when time matters, such as during search-and-rescue operations.

United States Government Accountability Office



Testimony

Before the Subcommittee on Coast
Guard and Maritime Transportation,
Committee on Transportation and
Infrastructure, House of Representatives

For Release on Delivery
Expected at 10:00 a.m. ET
Tuesday, January 30, 2018

COAST GUARD HEALTH RECORDS

Timely Acquisition of New System Is Critical to Overcoming Challenges with Paper Process

Statement of David A. Powner,
Director, Information Technology Management Issues

GAO Highlights

Highlights of GAO-18-363T, a testimony before the Subcommittee on Coast Guard and Maritime Transportation, Committee on Transportation and Infrastructure, House of Representatives

Why GAO Did This Study

In 2010, the Coast Guard initiated an effort—known as IHIS—to replace its aging EHR system with a new system that was to modernize various health care services for its nearly 50,000 military members. However, in October 2015, the Coast Guard announced that the modernization project would be canceled.

GAO was asked to summarize its report that is being released today on the Coast Guard's actions related to its EHR modernization initiative. GAO's testimony specifically addresses Coast Guard's (1) reasons for deciding to terminate further IHIS development; (2) management and oversight actions for the discontinued project and whether lessons learned were identified; (3) current process for managing health records and the challenges it is encountering; and (4) plans for effectively implementing a new EHR system and the current status of its efforts.

In preparing the report on which this testimony is based, GAO reviewed IHIS project expenditures; analyzed key project management documentation; surveyed Coast Guard's Regional Managers and clinical staff; and interviewed key staff.

What GAO Recommends

In the report being released today, GAO is recommending that the Coast Guard (1) expeditiously and judiciously pursue a new EHR system, and in doing so (2) ensure key processes are implemented; (3) establish project governance boards; and (4) document lessons learned from the IHIS project. The Department of Homeland Security concurred with GAO's recommendations.

View GAO-18-363T. For more information, contact David A. Pownier at (202) 512-9226 or pownierd@gao.gov.

January 2018

COAST GUARD HEALTH RECORDS

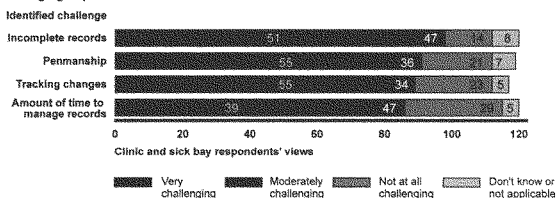
Timely Acquisition of New System Is Critical to Overcoming Challenges with Paper Process

What GAO Found

Financial, technical, schedule, and personnel risks led to the United States Coast Guard's (Coast Guard) decision to terminate the Integrated Health Information System (IHIS) project in 2015. According to the Coast Guard (a military service within the Department of Homeland Security), as of August 2017, \$59.9 million was spent on the project over nearly 7 years and no equipment or software could be reused for future efforts. In addition, the Coast Guard could not fully demonstrate the project management actions taken for IHIS, lacked governance mechanisms, and did not document lessons learned for the failed project.

In the absence of an electronic health record (EHR) system, the Coast Guard currently relies on a predominately paper health record management process to document health care services. Currently, the Coast Guard's clinical staff perform various manual steps to process each paper health record. Coast Guard Regional Managers and clinic and sick bay administrators informed GAO of the many challenges encountered in returning to a paper process. These challenges include the inability for some clinics to adequately track vital information such as medications—potentially causing harm to members if they take medications that have dangerous interactions.

Top Four Challenges Reported by Coast Guard Clinic and Sick Bay Administrators in Managing Paper Health Records



Source: GAO survey data. | GAO-18-363T

To help alleviate several of these challenges, the Coast Guard has developed alternative work-around processes. However, these alternative processes may not provide sustained solutions to overcoming these challenges.

In February 2016, the Coast Guard initiated the process for acquiring a new EHR system. As of November 2017, agency officials had conducted research and recommended a solution based on performance, risk, cost, and schedule advantages. However, 2 years after canceling IHIS and moving toward a predominately manual process, the agency has not yet made a final determination on this. Successfully and quickly implementing an EHR system is vital to overcoming the challenges the Coast Guard currently faces in managing paper health records. The expeditious implementation of such a system can significantly improve the quality and efficiency of care to the thousands of Coast Guard active duty and reserve members that receive health care.

Chairman Hunter, Ranking Member Garamendi, and Members of the Subcommittee:

I am pleased to be here today to participate in your hearing on the United States Coast Guard's (Coast Guard) electronic health record (EHR) system. As part of its mission, the Coast Guard is tasked with providing health care to active duty and reserve members and ensuring the availability of quality, cost-effective health care for all eligible beneficiaries. To assist with this task, the agency has historically relied on EHR systems to perform such functions as scheduling patient appointments, documenting patient consults and referrals, and tracking prescribed medications.

In 2010, the Coast Guard's Health Safety and Work-Life Directorate (HSWL)¹ initiated an effort to replace the agency's aging EHR systems with a new system called the Integrated Health Information System (IHIS). This system was to modernize various health care services and provide additional functionality, such as a document management system, which was previously lacking. The project consisted of various contracts with 25 different vendors and was estimated to cost approximately \$56 million to implement. However, in October 2015, the Coast Guard announced that the modernization project would be canceled.

As requested, my statement summarizes our report that is being released today on the Coast Guard's actions related to its EHR modernization initiative and its current health records management process.²

Specifically, the statement addresses the Coast Guard's (1) reasons for deciding to terminate further IHIS development and how much it spent on the project; (2) management and oversight actions for the discontinued EHR modernization project and whether lessons learned were identified; (3) current process for managing health records and the challenges it is

¹The Coast Guard's HSWL Directorate is responsible for ensuring the readiness and health of nearly 50,000 members throughout the United States. In this regard, the Office of Health Services within HSWL is charged with providing healthcare to Coast Guard members, other military active duty and reserve members, retired personnel, and eligible family members. The Coast Guard's healthcare services are supported by 41 U.S. based health clinics and 125 sick bays.

²GAO, *Coast Guard Health Records: Timely Acquisition of New System Is Critical to Overcoming Challenges with Paper Process*, GAO-18-59 (Washington, D.C.: Jan. 24, 2018).

encountering; and (4) plans for effectively implementing a new EHR system and the current status of its efforts.

Among other steps, in conducting our work, we reviewed IHiS project expenditures; analyzed key project management documentation; surveyed Regional Managers and clinical staff regarding challenges they face in managing paper health records and any mitigation strategies; and interviewed knowledgeable staff about the project. Our related report includes a detailed explanation of the scope and methodology for our work.

We conducted the work on which this testimony is based in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

**The Coast Guard
Attributed IHiS
Termination to
Financial and Other
Risks, after Spending
Approximately \$60
Million on the Project**

According to the Director of HSWL, who was appointed to the position in August 2015, financial, technical, schedule, and personnel risks led the Coast Guard's Executive Oversight Council³ to decide to terminate the IHiS project in October 2015:

- **Financial risks.** Internal investigations were initiated in January 2015 and May 2015 to determine whether the HSWL Directorate had violated the Antideficiency Act⁴ by using incorrect funding sources and incorrect fiscal year funds for the IHiS project. The Coast Guard ordered project management and contractor staff to cease work on

³The Executive Oversight Council is an admiral/senior executive service-level group established to monitor major risks, address emergent issues, review acquisition phase exit criteria progress, and provide direction to cross-directorate teams to support the successful execution of major and non-major acquisitions.

⁴The Antideficiency Act prohibits federal employees from, among other things, making or authorizing an expenditure or obligation that exceeds the amount available in an appropriation or fund. 31 U.S.C. § 1341(a)(1)(A). See GAO, *Principles of Federal Appropriations Law*, Vol. 3, 3rd ed., ch. 6, § C.1., GAO-06-382SP (Washington, D.C.: September 2008).

IHiS until a determination was made regarding the antideficiency violation.⁵

- **Technical risks.** IHiS lacked an independent security assessment and full interface testing to ensure security and data integrity. In addition, key functionality for the system, such as user verification, had not been completed.
- **Schedule risks.** The HSWL Director stated that she requested that the Department of Defense's (DOD) Defense Health Agency Solution Delivery Information Technology (IT) team⁶ independently validate the IHiS timelines and the status of the project in 2015 because of the identified technical risks and concerns as to whether the system would be ready to be piloted in the fall of 2015. According to the Director, the Defense Health Agency team projected the timeline for the first clinic implementation to be approximately 1 year later than originally estimated due, in part, to incomplete interfaces and workflows.
- **Personnel risks.** Although HSWL staff had been managing the IHiS project since it was initiated in 2010, Command, Control, Communications, Computers, and Information Technology (C4&IT)⁷ was directed to assume the oversight responsibilities for IHiS implementation in May 2015. This action was due to concerns about the project's adherence to established governance processes raised by the internal investigators looking into the potential Antideficiency Act violations. By August 2015, the key HSWL project management personnel that had overseen the project since 2010 had been removed. As a result of the changes in staff, one vendor noted that it

⁵The investigation for the funding sources was completed in November 2015, and the investigation for fiscal year funding was completed in February 2016. It was determined in both cases that no Antideficiency Act violation had occurred. In this testimony, we are not assessing or commenting on the Antideficiency Act claims relevant to this issue.

⁶According to its website, the Defense Health Agency is a joint, integrated combat support agency that enables the Army, Navy, and Air Force medical services to provide a medically ready force and ready medical force to combatant commands in both peacetime and wartime. The Solution Delivery Division within the Defense Health Agency is to deliver IT solutions to the Military Health System through acquisition program management, process re-engineering, information translation and sharing, training, and integration activities in order to support and advance the delivery of health care to its patients.

⁷C4&IT is responsible for designing, developing, deploying, and maintaining C4&IT solutions for the entire Coast Guard. The Deputy Assistant Commandant for C4&IT serves as the Coast Guard's Chief Information Officer (CIO).

was unclear as to who were the stakeholders, responsible parties, and decision makers.

According to an analysis conducted by the Coast Guard, which included obligations and expenditures from September 2010 to August 2017, the agency had obligated approximately \$67 million for the IHiS project and, of that amount, had spent approximately \$59.9 million at the time of its cancellation. In addition, over 2 years after the project's cancellation, the Coast Guard continued to pay vendors. In this regard, it paid approximately \$6.6 million to vendors between November 2017 and February 2018 to satisfy existing contractual obligations for services such as leased equipment that was damaged or missing; software licensing and support; a data storage center; and removal and shipment of equipment. Further, according to staff in Coast Guard's Office of Budget and Programs, no equipment or software from the IHiS project could be reused for future efforts.

**The Coast Guard
Could Not
Demonstrate Effective
Project Management,
Lacked Governance
Mechanisms, and Did
Not Document
Lessons Learned for
the IHiS Project**

The Coast Guard could not demonstrate that it effectively managed and oversaw the IHiS project prior to its discontinuance, and did not document and share valuable lessons learned from the failed project. Specifically, although the Coast Guard was to follow its System Development Life Cycle (SDLC) Practice Manual to guide its management and oversight of the project, the agency could not provide complete evidence that it had addressed 15 of the 30 SDLC practices we selected for evaluation.⁸ For example, the Coast Guard could not demonstrate that it had conducted IHiS system testing, although the agency granted an authority to operate (ATO)⁹ and indicated in the ATO memorandum that the system had undergone some form of testing. The Coast Guard's SDLC specifies that system testing is to take place prior to the issuance of an ATO.

Project team members provided inconsistent explanations regarding whether or not documentation existed to demonstrate the actions taken to manage and oversee the project. The absence of the various documents and other artifacts that would support the required SDLC activities raises doubts that the Coast Guard took the necessary and appropriate steps to ensure effective management of the IHiS project.

Further, although the Coast Guard developed charters for various governance boards to provide project oversight and direction, the boards were not active and the Chief Information Officer (CIO) was not included as a member of the boards. Taking steps to fully implement governance boards that include the CIO will be important to the Coast Guard's oversight efforts in implementing a future EHR system and may decrease the risk of IT project failure.

⁸The practices we selected are in the initial four phases of the SDLC—Conceptual Planning, Planning and Requirements, Design, and Development and Testing. The remaining three phases—Implementation, Operations and Maintenance, and Disposition—were not applicable to the project as it was canceled prior to system implementation. More information on our methodology for selecting the SDLC phases and practices can be found in our report released today.

⁹The National Institute of Standards and Technology Special Publication 800-37 defines the ATO as the official management decision given by a senior organizational official to authorize operation of an information system and to explicitly accept the risk to organizational operations (including mission, functions, image, or reputation), organizational assets, individuals, other organizations, and the nation based on the implementation of an agreed-upon set of security controls. According to the Coast Guard's SDLC Practice Manual, an ATO is required prior to deploying a pilot of the system in the production environment.

Lastly, although Coast Guard officials stated that lessons learned had been identified throughout the process of developing IHiS, as of 2 years after its cancellation, the agency had not documented and shared any lessons learned from the project and did not have established plans for doing so. Until the Coast Guard takes steps to document and share identified lessons learned with individuals charged with developing and acquiring its IT systems, opportunities to protect future systems against the recurrence of mistakes that contributed to the failure of IHiS will likely be missed.

The Coast Guard Is Managing Health Records Using a Predominately Paper Process, but Many Challenges Hinder Service Delivery

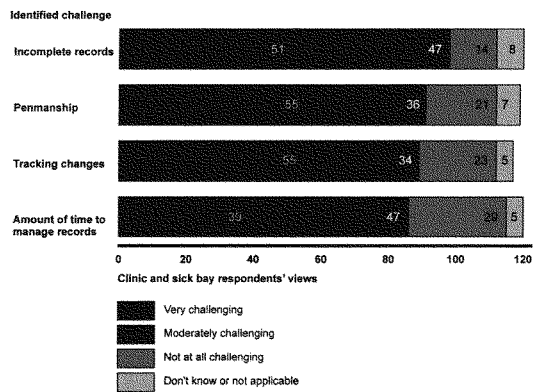
In the absence of an EHR system, the Coast Guard is relying on a predominately paper health record management process to document health care services for its nearly 50,000 military members. Currently, the Coast Guard's clinical staff perform various manual steps to process each paper health record. For example, clinical staff schedule appointments for patients using Microsoft Outlook's calendar feature and provide the patient with paper forms for completion upon his or her arrival. In addition, clinical staff must handwrite clinical notes in the paper health record during the appointment, as well as handwrite prescriptions, among other manual processes.

In response to our survey, the 12 HSWL Regional Managers identified a number of challenges that clinics and sick bays in their regions had experienced in managing and maintaining paper health records.¹⁰ These challenges were grouped into 16 categories. Further, the 120 clinic and sick bay administrators that subsequently responded to a separate survey reported varying degrees to which they viewed each category as challenging.¹¹ Figure 1 provides the clinic and sick bay respondents' views of the top four challenges.

¹⁰We surveyed all 12 Regional Managers and received a response from all 12 managers.

¹¹We sent surveys to all 166 local clinic and sick bay administrators and received a response from 120 of the 166 administrators.

Figure 1: Top Four Challenges Reported by Coast Guard Clinic and Sick Bay Administrators in Managing Paper Health Records



Source: GAO survey data. | GAO-18-363T

With regard to these top four challenges to managing and maintaining paper health records, clinic and sick bay respondents offered the following examples:¹²

Incomplete records. Ninety-eight (82 percent) of the respondents reported incomplete records¹³ as challenging. In this regard, 34 of the survey respondents reported that not all records from the Coast Guard legacy EHR systems were printed out and included in patients' paper health records as required before the systems were retired. Thus, they had no way to ensure the patients' paper records were complete.

¹²For the purpose of summarizing the responses to the identified challenges, each survey response of either very or moderately challenging was grouped together and was reported as "challenging." Our related report provides more detailed examples on all 16 categories.

¹³For the purposes of our survey, a paper record is incomplete when a patient's health record does not contain all the necessary health information, including the history of clinic visits, prescribed medications, or lab results.

Penmanship. Among the 91 (76 percent) survey respondents that reported penmanship as challenging, several respondents noted that it is difficult for staff to read illegible handwritten medical notes. This, in turn, results in difficulty determining the accurate diagnosis, the required prescription, or a referral.

Tracking medications. According to 89 (76 percent) of the respondents, it is challenging to track medications without an EHR. For example, one administrator stated that staff members rely heavily on patients to remember what medications they are taking—potentially causing harm if patients cannot remember what medications they are taking and the medications have dangerous interactions.

Amount of time to manage records. According to 86 (72 percent) of the respondents, managing paper health records is challenging and requires more time for staff to complete and file paperwork. Several respondents stated that the size of the paper health records has increased, resulting in additional time required to review and file records.

The responding clinic and sickbay administrators described a range of alternative work-around processes that they have developed to help alleviate several of the challenges. Specifically, they reported having developed additional forms, tracking methods, and alternative processes, as well as having notified Coast Guard HSWL management of the challenges they face. However, these alternative processes may not provide sustained solutions to overcoming these challenges. Until Coast Guard implements a new EHR solution, the challenges inherent in a predominantly paper process will likely remain.

The Coast Guard Intends to Acquire a New EHR System, but Has Not Yet Chosen a Solution

The Coast Guard has begun taking steps to acquire a new EHR system referred to as the Electronic Health Record Acquisition (eHRa). The Coast Guard plans to manage and oversee the acquisition of eHRa through its non-major¹⁴ acquisition process (NMAP), as described in its *Non-Major Acquisition Process (NMAP) Manual*.¹⁵ NMAP requires formal approval reviews at three discrete knowledge points called acquisition decision events (ADE) and includes three phases to assess the readiness and maturity of the acquisition.¹⁶

The Coast Guard formally identified the need for a new EHR system on February 1, 2016, and obtained approval for the first of three ADE's on February 13, 2016. It subsequently initiated market research activities by collecting cost, schedule, and capabilities information from commercial and government solution providers, including DOD and the Department of Veterans Affairs.

The Coast Guard used the providers' responses to develop an alternatives analysis report that was completed in October 2017. The report recommended a solution based on performance, risk, cost, and schedule advantages. The report indicated that the Coast Guard plans to use the results of the alternatives analysis to refine the acquisition strategy, and to support the development of artifacts which are required to successfully achieve the ADE-2 milestone. Staff within the Acquisitions Directorate stated that they were also in the process of finalizing a life cycle cost estimate and a project plan for eHRa—documents necessary for ensuring that appropriate business decisions will be made regarding eHRa's logistics, affordability, and resources, among other things.

¹⁴According to the Coast Guard, a non-major acquisition is a procurement greater than \$10 million in procurement costs and less than \$300 million in life cycle costs. Major acquisitions are characterized as procurements above \$300 million in life cycle costs.

¹⁵The Coast Guard implemented this process for non-major IT acquisitions in December 2012. It is intended to provide oversight of non-major acquisitions. As of August 2017, the Coast Guard was in the process of updating the NMAP. See Coast Guard, *Non-Major Acquisition Process (NMAP) Manual*, COMDTINST M5000.11B (Washington, D.C.: Dec. 31, 2012).

¹⁶Our related report provides a more detailed discussion of each ADE and each of the three phases that make up the NMAP process.

As of December 2017, the Coast Guard had not yet made a final determination as to which option would be chosen as the solution for the eHRA acquisition.

**Implementation of Our
Recommendations Should
Better Position Coast
Guard to Overcome
Challenges with Paper
Health Records**

Our report that is being released today contains four recommendations to the Coast Guard. Specifically, we recommend that the Coast Guard:

- expeditiously and judiciously pursue the acquisition of a new EHR system;
- ensure established processes required for the future acquisition or development of an EHR are effectively implemented and adequately documented;
- direct the Chief Information Officer and the Chief Acquisition Officer to establish and fully implement project governance boards for the future EHR effort that include the Chief Information Officer; and
- document any lessons learned from the discontinued IHIS project, share them with the new project management team, and ensure lessons learned are utilized for the future EHR effort.

The Department of Homeland Security¹⁷ concurred with our four recommendations and identified actions being taken or planned to implement them. If the Coast Guard fully and effectively implements our recommendations, many of the challenges faced by its clinics and sick bays and the thousands of Coast Guard members utilizing its health services could be diminished.

In summary, given the numerous challenges inherent with managing and maintaining paper health records, it will be important for the Coast Guard to prioritize obtaining an EHR for its thousands of members. Until a solution for its EHR system is chosen and successfully implemented, the agency is likely to continue to face these challenges. In addition, ensuring established project management and governance processes are effective, as well as documenting and sharing lessons learned, will be essential in avoiding past mistakes and helping to ensure a successful implementation of a future EHR solution at the Coast Guard.

¹⁷The Coast Guard is a military service within the Department of Homeland Security.

Chairman Hunter, Ranking Member Garamendi, and Members of the Subcommittee, this concludes my prepared statement. I would be pleased to respond to any questions that you may have.

GAO Contact and Acknowledgments

If you or your staff have any questions about this testimony, please contact David A. Powner, Director, Information Technology Management Issues, at (202) 512-9286 or pownerd@gao.gov. Contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page of this testimony statement. GAO staff who made key contributions to this statement are Nicole Jarvis (Assistant Director), Ashfaq Huda (Analyst in Charge), Sharhonda Deloach, Rebecca Eyler, Monica Perez-Nelson, and Scott Pettis.

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**"Examination of Reports on the El Faro Marine Casualty and
Coast Guard's Acquisition of Electronic Health Records System"
Subcommittee on Coast Guard and Maritime Transportation Hearing
Tuesday, January 30, 2018, 10:00 a.m.
Washington, D.C.**

Responses to Questions for the Record from U.S. GAO

1. What went wrong with the Coast Guard's implementation of the System Development Life Cycle Process (SDLC) processes? What broke down?

As noted in our related report, the Coast Guard did not effectively manage and oversee the Integrated Health Information System (IHIS) project.¹ More specifically, the agency could not demonstrate that it had addressed selected SDLC practices and the documentation to support its efforts often was not available.

In an effort to institute disciplined, repeatable practices for information technology (IT) development and acquisition, the Coast Guard developed the SDLC Practice Manual,² which establishes a seven-phase methodology for developing the systems for the Coast Guard's Assistant Commandant for Command, Control, Communications, Computers, and Information Technology (C4&IT),³ to include IHIS. The practice manual is intended to guide project management teams through a progression of activities for managing and overseeing IT projects from conceptual planning to disposition. However, the agency could not provide complete evidence that it had addressed 15 of the 30 SDLC practices we selected for evaluation. In addition, IHIS project team members provided inconsistent explanations regarding the availability of documentation to support the project management practices for IHIS.

The absence of the various documents and other artifacts that addressed the required SDLC practices raised doubts that the Coast Guard took the necessary and appropriate steps to ensure effective management of the IHIS project. Carrying out established practices for effective management and oversight of IT projects will be important for supporting any system development and acquisition effort that the Coast Guard undertakes to implement a future electronic health record (EHR) system.

2. How unusual is it for the federal government to continue to pay vendors after a contract has been cancelled, and when the vendors cannot deliver any product, data, software or equipment that the Coast Guard could potentially use in the future?

It is not unusual for the government to make payments to contractors after the end of a contract, but those payments are based on the specific terms of the contract, as well as the

¹GAO, *Coast Guard Health Records: Timely Acquisition of New System Is Critical to Overcoming Challenges with Paper Process*, GAO-18-59 (Washington, D.C.: Jan. 24, 2018).

²Coast Guard, *U.S. Coast Guard Systems Development Life Cycle (SDLC) Practice Manual, Revision 1.0* (Washington, D.C.: Dec. 11, 2009); *U.S. Coast Guard SDLC Practice Manual, SDLC Product #107 Revision 4.0* (Washington, D.C.: Nov. 30, 2011).

³The Coast Guard's Command, Control, Communications, Computers, and Information Technology (C4&IT) is responsible for designing, developing, deploying, and maintaining C4&IT solutions for the entire Coast Guard. The Deputy Assistant Commandant for C4&IT serves as the Coast Guard's CIO.

circumstances under which the contract was completed, terminated, or cancelled. Our recent work evaluating the extent of contract closeout backlogs at five federal agencies pointed out that, on some contract types, the federal government can take longer than usual to determine the final payment after a contract has been completed—possibly exposing the government to financial risk.⁴ The report highlighted the need for improvements in the oversight and management of contracts in the closeout process in order to minimize exposure and risk of improper payments to the government. In addition, our March 2008 report on contract termination costs noted that when the government terminates a contract for convenience, it must compensate the contractor for the incurred costs on the completed work, a fee or profit on that work, and the termination costs.⁵ There are, however, limits to these costs as determined by the contract.

As noted during my testimony, the Coast Guard continued to pay vendors millions of dollars for over 2 years after cancelling IHiS in order to satisfy existing contractual obligations—in one case because it had exercised the contract option period just prior to cancelling the project.⁶

According to staff in the Coast Guard's Acquisition Directorate:

- \$102,993 was paid in November 2017 to one vendor for leased equipment that was damaged or missing, as part of closing out the contract.
- \$460,352 was paid in November 2017 to an equipment vendor because the Coast Guard was obligated to do so after it had exercised the contract option period just prior to cancelling IHiS.
- Approximately \$872,000 was paid to various vendors by November 2017 as part of closing out other contractual obligations for items such as software licensing and support and a data storage center.
- Approximately \$2.4 million was to be paid to one vendor by February 2018 for software and licensing products.
- Approximately \$2.8 million was to be paid by February 2018 for removal and shipment of equipment.

3. The GAO is critical of the Coast Guard's poor oversight of this acquisition program, but especially calls out the absences of governance as a key detriment. Can you please elaborate on this point? Why was ineffectual governance such a liability in this case?

Our review found that the Coast Guard lacked governance mechanisms and failed to undertake a number of key project management practices that were essential to ensuring effective oversight of the IHiS initiative. According to GAO's *IT Investment Management Framework*, efforts to build a foundation for IT governance involve establishing specific critical processes, such as instituting investment boards and controlling investments as they are developed.⁷

⁴GAO, *Federal Contracting: Additional Management Attention and Action Needed to Close Contracts and Reduce Audit Backlog*, GAO-17-738 (Washington, D.C.: Sept. 28, 2017).

⁵GAO, *Defense Acquisitions: Termination Costs Are Generally Not a Compelling Reason to Continue Programs or Contracts That Otherwise Warrant Ending*, GAO-08-379 (Washington, D.C.: March 14, 2008).

⁶GAO-18-59.

⁷GAO, *Information Technology Investment Management: A Framework for Assessing and Improving Process Maturity, Version 1.1*, GAO-04-394G (Washington, D.C.: March 2004).

Toward this end, the Coast Guard attempted to establish a governance structure for the IHiS project by creating four governance bodies that were intended to provide oversight.⁸

However, the Coast Guard could not provide evidence that the governance bodies had ever been active in overseeing the IHiS project prior to its cancellation. In addition, the Chief Information Officer (CIO) was not included as a member of any of the governance bodies. According to a memorandum signed by the Acting CIO in 2011, C4&IT was responsible for ensuring that the IHiS project was compliant with SDLC requirements. However, the Coast Guard could not provide evidence that demonstrated how C4&IT and the CIO were involved in ensuring compliance with the requirements.

We have long reported that federal IT projects have failed due, in part, to a lack of oversight and governance, especially by officials at an executive level, such as the CIO. However, as previously stated, critical processes that included the right executive-level attention were not implemented for the IHiS project. Therefore, in our related report, we recommended that the Coast Guard establish and fully implement project governance boards for the future EHR effort that include participation by the CIO. Doing so will be essential to help limit the risk of further project failure.

4. How best might the Coast Guard correct this deficiency?

To mitigate the lack of effective governance and oversight for its future EHR acquisition, it will be critical for the Coast Guard to ensure that the appropriate executive-level stakeholders, such as the CIO, Chief Acquisition Officer (CAO), and the Health, Safety and Work-Life (HSWL) Director, are fully engaged in monitoring major program risks and addressing emergent issues as they arise. As previously stated, we have found that many IT projects have failed because of the lack of oversight at the executive level. Thus, involving the appropriate stakeholders early on in the acquisition process will be key to overcoming the shortcomings that the Coast Guard faced with the failed IHiS project. The Coast Guard already has the policies and procedures in place to engage these executives. However, unless the agency fully and effectively implements those policies and procedures, it risks similar outcomes with any future EHR solutions.

5. Judging from your many years of auditing projects similar to IHiS, how critical a liability was the non-involvement of the Chief Information Officer? Was this project doomed from the start?

The lack of involvement from the CIO was one of the critical elements that contributed to the failure of IHiS. The CIO's office was to ensure that the IHiS project was compliant with SDLC requirements. However, the Coast Guard could not provide evidence that demonstrated how the CIO's office was involved in ensuring compliance with the requirements and, thus, that IHiS was being effectively managed. Our report concluded that the lack of effective project management and governance mechanisms, which included the absence of the CIO's oversight, reduced the probability of the IHiS project's success.

⁸The four governance boards were: (1) the Executive Steering Committee, which was to provide executive oversight of the design, implementation, operation, and long term direction for IHiS; (2) the User Group, which was to make recommendations to the IHiS Program Management Office on functionality and system design and to ensure that decisions were based on end-user needs; (3) the Change Control Board, which was to evaluate change proposals in regard to technical, user, and cost impact to the system and recommend change requests to the IHiS baseline; and (4) the System Security Committee, which was to manage the risk to IHiS and identify and mitigate security vulnerabilities.

6. How easily will it be for the Coast Guard to correct it?

As the Coast Guard moves toward acquiring a new EHR, it will be essential for the agency to be diligent in effectively managing and overseeing its efforts. This would include ensuring the involvement of key executives, such as the CIO, CAO, HSWL Director, and others represented through established and fully implemented project governance boards.

7. How big of a risk does this present to the healthcare of the 50,000 men and women in the active duty Coast Guard and Reserves?

The absence of an EHR at the Coast Guard's clinics and sick bays introduces significant risks that can affect that quality of care provided to the agency's military members. Our related report highlighted a number of the risks identified by clinic and sick bay administrators that can hinder the Coast Guard's ability to deliver services.⁹ For example, 82 percent of the clinic and sick bay administrators that responded to our survey reported that incomplete records were a challenge to effectively managing paper health records. One respondent stated that this was due to parts of the record being dispersed across different medical facilities, thus, making it difficult to put together a complete patient medical history.

In addition, according to 76 percent of the clinic and sick bay respondents, the lack of an EHR made tracking medications challenging. One administrator stated that the lack of an EHR made the management of patient medication use difficult, as staff were unable to verify what medications a patient was taking, what medications had been prescribed from an outside location, and/or the effectiveness of medications. Another administrator stated that staff members relied heavily on patients to remember what medications they were taking—potentially causing harm if patients could not remember what medications they were taking and the medications had dangerous interactions. Further, the lack of an EHR had resulted in an increase in the amount of time required to check-in patients, complete patient appointments, and enter information in the patient record, among other challenges highlighted in our report.

Until the Coast Guard implements a new EHR solution, the numerous challenges inherent in a predominantly paper process will likely remain. Successfully and expeditiously implementing an EHR system is vital to overcoming these challenges and to helping improve the quality and efficiency of care to the thousands of Coast Guard active duty and reserve members that receive health care.

8. In your opinion, is the Coast Guard acting with the type of alarm necessary to address this threat in the timeliest fashion possible?

The Coast Guard has not yet demonstrated a clear sense of urgency in its approach to mitigating challenges resulting from the lack of an EHR, which is why we recommended that the Coast Guard expeditiously and judiciously pursue its acquisition of a new EHR system. This lack of urgency has prevented the Coast Guard from addressing the various challenges it faces in using a predominately paper process in its clinics and sick bays.

Although the Coast Guard had begun taking steps to acquire a new EHR system, as of January 2018—over 2 years after the cancellation of the IHIS project—the agency had not yet selected a

⁹GAO-18-59.

solution. Currently, the agency is in the analyze and select phase, which is the first of three phases within its acquisition process.¹⁰ This phase includes project management activities such as conducting market research to identify available alternatives, preparing a requirements document, developing an acquisition strategy, developing a life cycle cost estimate, and preparing a project plan. The agency has completed a requirements document and assessed industry capabilities as part of its market research, but is still in the process of refining their acquisition strategy and finalizing a life cycle cost estimate and a project plan for a new system—documents necessary for ensuring that appropriate business decisions will be made regarding logistics, affordability, and resources, among other things. Until a solution is expeditiously chosen and implemented, the Coast Guard and its thousands of members will likely continue to face the various challenges inherent to using a predominately paper process.

9. If not, what can they do to expedite the process but not repeat the same mistakes?

To facilitate an expeditious and successful implementation of a new EHR system, we urge the Coast Guard to look for ways to accelerate the acquisition process. According to staff in the Coast Guard's Acquisitions Directorate, the average estimated time frame for completing all the activities within the acquisition process is 2 to 4 years. To help ensure the success of its efforts, as well as accelerate the acquisition process, the Coast Guard could consider pursuing the same EHR system that is being acquired by the Department of Defense and the Department of Veterans Affairs. Regardless of the approach that the Coast Guard pursues, it will be important for the agency to incorporate improved governance mechanisms in its acquisition process, as highlighted in our report and testimony.¹¹

¹⁰The Coast Guard's acquisitions process is made up of three Acquisition Decision Events (ADE) and three phases. The ADEs are discrete knowledge points to assess the readiness and maturity of the acquisitions to proceed to the next phase.

¹¹GAO-18-59 and GAO, *Coast Guard Health Records: Timely Acquisition of New System Is Critical to Overcoming Challenges with Paper Process*, GAO-18-363T (Washington, D.C.: Jan. 30, 2018).

COAST GUARD MARINE BOARD OF INVESTIGATION
RECOMMENDATIONS

Safety Recommendations

Recommendation #1 – High Water Alarms. It is recommended that Commandant direct a regulatory initiative to require high water audio and visual alarms, capable of providing audible and visual alarms on the navigation bridge, in cargo holds of dry cargo vessels. Furthermore, it is recommended that Commandant work with the International Maritime Organization (IMO) to amend the applicability of SOLAS Chapter II-1/25 (2015 consolidated) to include all new and existing multi-hold cargo ships.

Recommendation #2 – Ventilators and Other Hull Openings for Cargo Ships. It is recommended that Commandant direct a review of U.S. regulations, international conventions, and technical policy to initiate revisions to ensure that all ventilators or other hull openings, which cannot be closed watertight or are required to remain normally open due to operational reasons such as continuous positive pressure ventilation, should be considered as down-flooding points for intact and damage stability. Additionally, fire dampers or other closures protecting openings required to remain normally open due to operational reasons such as continuous positive pressure ventilation should not be considered weathertight closures for the purpose of the applicable Load Line Convention. These changes should apply to new and existing vessels.

Recommendation #3 – Addressing Safety Concerns Related to Open Lifeboats. It is recommended that Commandant initiate a Legislative Change Proposal and direct a regulatory initiative to eliminate open top gravity launched lifeboats for all oceangoing ships in the U.S. commercial fleet. As an immediate interim safety measure, it is recommended Commandant direct all Officers in Charge of Marine Inspection (OCMIs) to conduct a concentrated inspection campaign on all existing vessels outfitted with gravity launched open lifeboats, including a Coast Guard supervised launching and underway operational test of every lifeboat in service. This concentrated inspection campaign should also ensure that companies have adequately identified and addressed the hazards related to operating with open top gravity launched lifeboats in their identified Safety Management System (SMS) risks.

Recommendation #4 – Indicators for Watertight Closures on Bridge Alarm Panels. It is recommended that Commandant direct a regulatory initiative to require open/close indicators on the bridge of all existing cargo ships, for all watertight closures that are identified as watertight on the conditions of assignment for assignment of load line form for unmanned and cargo spaces. Furthermore, it is recommended that Commandant work with the IMO to amend the applicability of paragraph 3 of SOLAS II-1/13-1 (2015 consolidated) to include all existing cargo ships. This change would require open/close indicators on the bridge of all existing cargo ships, for all watertight closures (e.g., doors, scuttles, fire dampers) that are identified as watertight on the conditions of assignment for assignment of load line form for unmanned compartments and cargo spaces.

Recommendation #5 – Requirement for Closed Circuit Television (CCTV) Camera Installation in Stowage Areas. It is recommended that Commandant direct a regulatory initiative to require

the installation of CCTV cameras to monitor unmanned spaces from the bridge cargo vessels, such as cargo holds and steering compartments. Furthermore, it is recommended that Commandant work with the IMO to create a new requirement to install and utilize CCTV cameras, or other similar technology, in cargo stowage areas on cargo ships.

Recommendation #6 – Vessel Weight Change Tracking. It is recommended that Commandant direct a regulatory initiative to require that a company maintain an onboard and shore side record of all incremental vessel weight changes, to track weight changes over time so that the aggregate total may be readily determined.

Recommendation #7 – Approval of Software for Cargo Loading and Securing. It is recommended that Commandant direct a regulatory initiative to require review and approval of software that is used to perform cargo loading and securing calculations. Furthermore, it is recommended that Commandant work with the IMO to implement international requirements for review and approval of such software.

Recommendation #8 - Review and Approval of Stability Software. It is recommended that Commandant update policy to address Coast Guard review and approval of stability software, and delegate review and approval authority to ACSs, where appropriate. This should include establishing specific policy and assigning technical requirements for review and approval of stability software by the Coast Guard, which may be required to review and approve such software for vessels that do not fall under the Alternate Compliance Program (ACP) or Navigation and Vessel Inspection Circular (NVIC) 3-97 authorities.

Recommendation #9 – Float-free Voyage Data Recorder (VDR) Equipped with an Emergency Position Indicating Radio Beacon (EPIRB). It is recommended that Commandant direct a regulatory initiative to require that all VDR capsules be installed in a float-free arrangement, and contain an integrated EPIRB for all domestic vessels currently required to be equipped with a VDR. Furthermore, it is recommended that Commandant work with the IMO to amend SOLAS V/20 (2015 consolidated) to require this VDR configuration for existing vessels.

Recommendation #10 – Locating and Marking Objects in the Water. It is recommended that Commandant direct an examination of the reliability rate of SLDMBs and other similar technology used during Coast Guard Search and Rescue operations. Additionally, the Coast Guard should develop pre-deployment protocols to conduct circuit testing on beacons prior to deploying them on-scene.

Recommendation #11 – Attachable Beacon for Assisting in Relocating Search Objects that are Initially Unrecoverable. It is recommended that Commandant identify and procure equipment that will provide search and rescue units the ability to attach a radio or Automated Identification System/strobe beacon to a found search object that is not immediately retrievable. This beacon should be able to be quickly activated and attached to the object, and have a lanyard of sufficient length to keep the beacon on the surface of the water if the object sinks below the surface.

Recommendation #12 – Personal Locator Beacon Requirement. It is recommended that Commandant direct a regulatory initiative to require that all Personal Flotation Devices on oceangoing commercial vessels be outfitted with a Personal Locator Beacon.

Recommendation #13 – Anonymous Safety Reporting to Shore for Ships at Sea. It is recommended that Commandant direct the development of a shipboard emergency alert system that would provide an anonymous reporting mechanism for crew members to communicate

directly with the Designated Person Ashore or the Coast Guard while the ship is at sea. The system would be in place to report urgent and dire safety concerns that are not being adequately addressed onboard the ship or by shore based company resources in a timely manner.

Recommendation #14 – National Oceanographic and Atmospheric Administration (NOAA) Evaluation of Forecast Staffing and Products for Maritime Interests. It is recommended that Commandant request that NOAA evaluate the effectiveness and responsiveness of current National Weather Service (NWS) tropical cyclone forecast products, specifically in relation to storms that may not make landfall but that may impact maritime interests. To improve service to marine stakeholders the evaluation should consider the inclusion of past track waypoints for the tropical system for a period of 48 hours and a graphical depiction of the forecast model track of the best performing prediction models.

Recommendation #15 – Clarification of Flag State Expectations for SMS Implementation. It is recommended that Commandant direct the development and implementation of policy to make it clear that the Coast Guard has a shared responsibility to assess the adequacy of a company's SMS. This responsibility includes, but is not limited to, assessing identified risks and contingency plans (as described in IMO Resolution A.1072(28)), and ensuring that the duties, authorities, and qualifications of the Designated Person Ashore and other shore side management who support vessel operations while underway are specifically described.

Recommendation #16 – Damage Control Information for Existing Cargo Vessels. It is recommended that Commandant direct a regulatory initiative to require that all cargo ships have a plan and booklets outlining damage control information. Furthermore, it is recommended that Commandant work with the IMO to amend the applicability of SOLAS Chapter II-1/19 (2015 consolidated), to apply to all existing cargo ships, ensuring these ships have the damage control information.

Recommendation #17 – Ship Specific Damage Control Competency. It is recommended that Commandant direct a regulatory initiative to update 46 CFR to establish damage control training and drill requirements for commercial, inspected vessels. Furthermore, it is recommended that Commandant work with the IMO to amend SOLAS to establish similar requirements.

Recommendation #18 – Evaluation of Mariner Training Institutions and Coast Guard Merchant Mariner Credentialing Process. It is recommended that Commandant direct a review of the EL FARO VDR transcript and this Report of Investigation, specifically focusing on the effectiveness of the Coast Guard credentialing exams and third party provided training including navigation simulators, heavy weather avoidance, cargo lashing/securing, stability, damage control, and bridge resource management. The Coast Guard should use the review to identify potential areas and competencies needing improvement and expeditiously develop a plan to implement those findings into the mariner credentialing process.

Recommendation #19 – Electronic Records and Remote Monitoring of Vessels at Sea. It is recommended that Commandant direct a regulatory initiative to require electronic records and periodic electronic transmission of records and data to shore from oceangoing commercial ships. This requirement would include records such as bridge and engine room logs, Standards of Training Certification and Watchkeeping (STCW) records, significant route changes, critical alarms, and fuel/oil records. The regulation should ensure Coast Guard access to these records regardless of their location. Furthermore, it is recommended that Commandant work with the

IMO to amend SOLAS to require this same electronic transmission of records from all oceangoing commercial ships.

Recommendation #20 – Prevention Training Course for Prospective Coast Guard Sector Commanders and Deputies. It is recommended that Commandant explore adding an OCMI segment to Training Center Yorktown’s Sector Commander Indoctrination Course for prospective officers who do not have the Prevention Ashore Officer Specialty Code, OAP-10. The recommended OCMI training segment would be similar to the additional Search and Rescue (SAR) Mission Coordinator Course that is currently required for prospective Sector Commanders and Deputies who lack previous SAR experience.

Recommendation #21 – Coast Guard Oversight of ACSs that Conduct ACP Activities. It is recommended that Commandant update NVIC 2-95 and Marine Safety Manual Volume II to require increased frequency of ACS and Third Party Organizations (TPOs) direct oversight by attendance of Coast Guard during Safety Management Certificate and Document of Compliance audits. Additionally, the Coast Guard shall perform a quality audit specific to the ACS representation and performance on U.S. flag vessels. The Coast Guard personnel conducting the oversight should be fully trained and certified to conduct audits, and given clear authority to issue non-conformities to a vessel, company, or ACS.

Recommendation #22 – ACP Efficiency and Manageability. It is recommended that Commandant direct a regulatory initiative to revise 46 CFR § 8.430 in order to eliminate the use of U.S. Supplements that currently exist for each ACS authorized to conduct all delegated activities. The regulatory revision should clarify that ACS personnel shall default to 46 CFR requirements in circumstances identified in the Critical Ship Safety Systems Table in the Federal Register on February 13, 1998 (63 FR 7495).

Recommendation #23 – ACS Accountability and Transparency. It is recommended that Commandant establish and publish an annual report of domestic vessel compliance. This report shall include domestic vessel no-sail rates for each type of inspected subchapter, and a methodology for associating a Coast Guard-issued no-sail control action with an ACS, for vessels found to have deficiencies or major non-conformities that were misclassified, or not previously identified during an ACS-led inspection or survey.

Recommendation #24 – ACS Surveyor Performance and Interactions with OCMI. It is recommended that Commandant direct the implementation of a policy requiring that individual ACS surveyors complete an assessment process, approved by the cognizant OCMI, for each type of delegated activity being conducted on behalf of the Coast Guard. The assessment shall ensure vessel surveys and audits meet the Coast Guard marine inspection standard. If an OCMI determines that an ACS surveyor’s performance is substandard, that OCMI should be given the authority to revoke the Surveyor’s authority to conduct surveys on their behalf.

Recommendation #25 – Competency for Steamship Inspections. It is recommended that Commandant direct a study to explore adding a Steam Plant Inspection course to the Training Center Yorktown curriculum. The course should be required for Coast Guard Marine Inspectors and made available to ACS surveyors who conduct inspections on behalf of the Coast Guard. The steam inspection course could serve as an interim measure until an Advanced Journeyman Course covering steam vessel inspections is implemented (please see Recommendation #26).

Recommendation #26 – Competency for Marine Inspections and ACS Surveyors Conducting Inspections on Behalf of the Coast Guard. It is recommended that Commandant direct the addition of an Advanced Journeyman Inspector course to the Training Center Yorktown curriculum. The course should cover ACS oversight, auditing responsibilities, and the inspection of unique vessel types. The course should be required for senior Coast Guard Marine Inspectors and made available to ACS surveyors who conduct inspections on behalf of the Coast Guard.

Recommendation #27 – Coast Guard Major Conversion Determinations for Vessels. It is recommended that Commandant direct the review of policies and procedures for making and documenting major conversion determinations, including use of the Precedence Principle.

Recommendation #28 – Intact and Damage Stability Standards Review. It is recommended that Commandant direct a review of current intact and damage stability standards to improve vessel survivability in extreme wind and sea conditions.

Recommendation #29 – Applying Intact and Damage Stability Standards to Existing Cargo Vessels. It is recommended that Commandant direct a regulatory initiative to require that all existing cargo vessels meet the most current intact and damage stability standards.

Safety Recommendation #30 – Third Party Oversight National Center of Expertise. It is recommended that Commandant consider creation of a Third Party Oversight National Center of Expertise to conduct comprehensive and targeted oversight activities on all third party organizations and ACSs that perform work on behalf of the Coast Guard. The Center of Expertise should be staffed with Subject Matter Experts that are highly trained inspectors, investigators, and auditors with the capability and authority to audit all aspects of third party organizations. As an alternative, the Coast Guard could add a new Third Party Oversight Office at Coast Guard Headquarters with a similar staffing model as the proposed Center of Expertise. The new Third Party Oversight Office could function similar to the Traveling Inspector Office and report directly to the Assistant Commandant for Prevention Policy.

Safety Recommendation #31 – Technical Review of Critical Propulsion System Components. It is recommended that Commandant immediately review a representative sample of existing engineering system plans and implement a policy to ensure future Coast Guard or ACS reviews of such plans consider the full designed operating range when reviewing design elements for critical propulsion system components (e.g., the operating range for lube oil systems should ensure satisfactory function for the full range of allowable oil sump levels and vessel lists.)

Administrative Recommendations

Administrative Recommendation #1 – Acquiring DNA Sample for Identification of Human Remains. It is recommended that Commandant direct the development and implementation of Coast Guard policy for the collection of DNA samples by Coast Guard personnel when deceased individuals are unable to be recovered during Search and Rescue cases or post-incident marine casualty investigations. These DNA samples could be used to provide identification of human remains

Administrative Recommendation #2 - VDR Performance Standards. It is recommended that Commandant direct a regulatory initiative to require that all VDRs capture all communications on ship's internal telephone systems. Furthermore, it is recommended that Commandant work with the IMO to amend SOLAS and update performance standards to ensure that all VDRs capture these two-way internal ship communications.

Administrative Recommendation #3 – VDR Data and Audio Access. It is recommended that Commandant initiate a Legislative Change Proposal to amend 46 U.S.C. Chapter 63, to ensure that, notwithstanding NTSB statutory authority, the Coast Guard has full access and ability to use VDR data and audio in marine casualty investigations, regardless of which agency is the investigative lead.

Administrative Recommendation #4 – MISLE Documentation of Deficiencies that the OCMI Refers to an ACS. It is recommended that the Commandant require the addition of specific MISLE data fields for documenting deficiencies that the OCMI refers to an ACS for correction. The deficiency should remain open in MISLE until the ACS provides the OCMI who issued the deficiency with a written report documenting corrective action has been completed or the condition has been appropriately recorded in the Class database. This will ensure that vessel compliance history is documented and accessible to Coast Guard Marine Inspectors and investigators.

Enforcement Recommendations

Recommendation #1 – TOTE Services Violations. It is recommended that Sector Jacksonville initiate civil penalty action against TOTE Services for the following offenses:

- Failure to comply with the work-rest requirements detailed in 46 U.S.C. § 8104 and 46 CFR § 15.1111 for EL FARO crew members on multiple dates prior to the accident voyage.
- Failure to comply with emergency procedures for special personnel detailed in 46 CFR § 199.180. Specifically, Polish ship rider Mr. Marek Pupp testified that he continued to conduct work on EL FARO during emergency muster and abandon ship drills.
- Failure to notify the Coast Guard or ABS of repairs to primary lifesaving appliances that were conducted on September 28, 2015 just prior to EL FARO's departure from Jacksonville on the accident voyage.
- Failure to notify the Coast Guard or ABS of repairs to EL FARO's main propulsion boiler superheating piping on August 24, 2015.

U.S. Department of
Homeland Security

United States
Coast Guard



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**STEAM SHIP EL FARO (O.N. 561732) SINKING AND LOSS OF THE VESSEL WITH
33 PERSONS MISSING AND PRESUMED DECEASED NORTHEAST OF ACKLINS
AND CROOKED ISLAND, BAHAMAS ON OCTOBER 1, 2015**

ACTION BY THE COMMANDANT

The record and the report of the Formal Investigation convened to investigate the subject casualty have been reviewed. The record and the report, including the findings of fact, analysis, conclusions, and recommendations are approved subject to the following comments and the enclosure.

COMMENTS ON THE REPORT

1. The loss of the EL FARO and all 33 persons aboard was a tragic and preventable accident. I offer my sincere condolences to the families and friends of the mariners whose lives were lost. The Coast Guard will take appropriate action on all that we have learned from this investigation.
2. I thank the members of the Marine Board of Investigation (MBI) for their exhaustive work and independent recommendations. The MBI conducted nearly their entire investigation in public view via live video, audio and online forums, providing an unprecedented degree of transparency to their proceedings. As a result, some vessel owners and operators were able to apply lessons learned in near real time, enhancing the safety of their own operations.
3. While many factors contributed to this marine casualty, by far the most prominent was the Master's decision to sail the ship in close proximity to a Category 3 hurricane. There were multiple opportunities to take alternate, safer routes as the storm approached. There was adequate information available regarding the threat posed by hurricane Joaquin, despite the unusually unpredictable nature of the storm's path and intensity. There were warnings and recommendations from the mates on successive watches to alter course to avoid the storm, but they were not heeded. The combination of these actions and events placed the EL FARO in harm's way near the eye of the storm, and subjected her to wind and sea conditions that prudent mariners avoid. In the case of the EL FARO, those conditions led to a chain of events, the effects of which were irreversible.
4. The ROI notes numerous failures on the part of TOTE Services, Inc. (TSI) to properly fulfill its obligations under the International Safety Management (ISM) Code. These include substandard materiel conditions aboard EL FARO's sistership, failure to provide basic safety training to the onboard riding gang, failure to conduct proper lifeboat drills, among others.

Most relevant to this casualty, however, was the company's failure to provide the necessary shoreside support for the master to perform his duties safely. The overriding authority of the master does not absolve TSI of their obligation under the ISM Code to provide such support. While TSI's Operation Manual - Vessel (OMV) did address heavy weather, it placed the entire responsibility for weather planning and preparation on the master, which is inconsistent with fundamental stated objectives of the ISM Code. According to TSI's former Designated Person Ashore (DPA), the company deliberately abandoned the practice of assisting masters with heavy weather voyage planning, storm system monitoring, and avoidance.¹ Understanding that the company routinely provided liner service in an area prone to hurricanes during hurricane season, the decision to abandon such a crucial support system is irresponsible and inexcusable.

5. The Coast Guard entrusts classification societies to carry out an extensive list of delegated functions that impact the safety of U.S. ships. The Coast Guard relies most heavily on the functions performed by the American Bureau of Shipping (ABS), an organization that provides vessel classification services for 92% of the U.S. deep draft fleet. Throughout the proceedings of the MBI, it was revealed that ABS failed to uncover or otherwise resolve longstanding deficiencies that adversely affect the safety and seaworthiness of vessels on multiple occasions. This casualty is a call to action. ABS can and must do better.
6. This casualty did not occur due to a lack of standards or requirements; rather it was the result of poor seamanship compounded by failure of the safety framework that should have triggered a series of corrective actions that likely would have prevented it. The Coast Guard, after the vessel owner and ABS, was the final element of the safety framework, responsible for ensuring that minimum standards were met. A competent and functional national administration is the cornerstone of maritime safety. As the lead agency of the U.S. Flag Administration, the Coast Guard is ultimately responsible to monitor the performance of third parties that perform delegated functions and also to guarantee the effectiveness of vessel inspections and surveys. Yet the Coast Guard failed to adequately oversee the third party in this case, and the investigation reveals that the Coast Guard has not sustained the proficiency and policy framework to do so in general. The Coast Guard is fully committed to rectifying the shortcomings that led to these failures.
7. As the pace and complexity of maritime commerce and operations have increased, third parties have enabled the regulatory regime to evolve and keep up with increasing demand. Third party programs, such as the Alternate Compliance Program (ACP), have transitioned from an option to a necessity upon which both the Coast Guard and the maritime industry rely. Responding to the recommendations on the 1983 capsizing and sinking of the S.S. MARINE ELECTRIC, the Commandant dissented with the MBI and concluded that the poor quality of surveys aboard that vessel could not be justifiably expanded to condemn the entire system of third-party delegations. The same is true in this case. The Coast Guard relies far more heavily on third parties today than at the time of the MARINE ELECTRIC casualty. Now, more than ever, the system requires reform. The Coast Guard must, and will, establish a risk-based and enduring policy framework that is simpler to execute and enables more robust oversight of delegated functions. Further, recognizing that the ACP is only one

¹ NTSB Interview transcript, Former Manager of Safety and Operations, DPA, March 27, 2017.

program among many that rely on delegation of technical functions and services to third parties, it is imperative that the lessons learned be applied universally to all programs that rely on a similar structure.

8. Parties in Interest and the families of the crew of the EL FARO were invited to submit comments to the Coast Guard on the MBI's Report of Investigation for my consideration. The results of my review and consideration of those comments regarding the findings of fact, analysis and conclusions is attached as an enclosure.
9. The MBI could not determine whether or not the sea suction piping of the emergency fire pump installed in cargo hold #3 was damaged by cargo that may have broken free in the hold, potentially contributing to flooding. Because of the potential for such damage, however, it is appropriate to ensure that vital systems and through hull penetrations fitted in cargo holds be protected from physical damage. The Coast Guard will consider requiring such protection in future regulatory initiatives.
10. This is a call to action for the entire maritime community. TOTE, ABS, and the Coast Guard must learn and move with a sense of urgency. This tragic story points to the need for a strong and enduring commitment at all elements of the safety framework. First and foremost, the company must commit to safety culture by embracing their responsibilities under the ISM Code. Secondly, Recognized Organizations (ROs) must fully and effectively perform their duties and responsibilities. Finally, the Coast Guard must, and will, provide the final safety net with sustainable policy, oversight, and accountability.

ACTION ON RECOMMENDATIONS

Safety Recommendation #1 – High Water Alarms. It is recommended that Commandant direct a regulatory initiative to require high water audio and visual alarms, capable of providing audible and visual alarms on the navigation bridge, in cargo holds of dry cargo vessels. Furthermore, it is recommended that Commandant work with the International Maritime Organization (IMO) to amend the applicability of SOLAS Chapter II-1/25 (2015 consolidated) to include all new and existing multi-hold cargo ships.

Action: I concur with this recommendation. Cargo hold flooding detection and audible/visual alarms on the navigation bridge should be fitted aboard new and existing cargo vessels, as recommended. This would be a practical means for the crew to detect and mitigate possible flooding conditions, particularly when heavy weather precludes safe access to these spaces. The Coast Guard will pursue a domestic regulatory initiative and work with the IMO to expand the applicability of SOLAS Chapter II-1/25 to include new and existing multi-hold cargo ships other than bulk carriers, which are already addressed separately.

Safety Recommendation #2 – Ventilators and Other Hull Openings for Cargo Ships. It is recommended that Commandant direct a review of U.S. regulations, international conventions, and technical policy to initiate revisions to ensure that all ventilators or other hull openings, which cannot be closed watertight or are required to remain normally open due to operational

reasons such as continuous positive pressure ventilation, should be considered as down-flooding points for intact and damage stability. Additionally, fire dampers or other closures protecting openings required to remain normally open due to operational reasons such as continuous positive pressure ventilation should not be considered weathertight closures for the purpose of the applicable Load Line Convention. These changes should apply to new and existing vessels.

Action: I partially concur with this recommendation. Existing regulations already require that all hull openings below the freeboard deck be fitted with watertight closures on all vessels. For vessels constructed after June 2016, SOLAS II-1/Reg 7-2 (in conjunction with the Unified Interpretation per MSC.1/Circ.1539) requires that ventilation for engine rooms and emergency generator rooms be considered as unprotected down-flooding points for damage stability purposes even if fitted with a closure. The Coast Guard will consider extending this interpretation to ventilation in RO-RO cargo spaces on both new and existing vessels, since ventilation systems for such spaces are generally of similar design to that installed in engine rooms and emergency generator rooms. However, for hull openings situated on any deck above the freeboard deck, there is no evidence to support that current closure requirements are insufficient. With regard to dual-purpose fire dampers, existing Coast Guard policy requires that they be strongly constructed, gasketed, and capable of being secured weathertight. However, it is noted that such dual purpose closures can cause confusion amongst the crew and may be impractical in situations where both flooding and fire are of concern. The company's Safety Management System (SMS) should ensure that crew members are familiar with the location of hull openings and their closures, to include appropriate operational procedures in their SMS. The Coast Guard will address this matter in the flag state action described in the planned action on Safety Recommendation #15.

Safety Recommendation #3 – Addressing Safety Concerns Related to Open Lifeboats. *It is recommended that Commandant initiate a Legislative Change Proposal and direct a regulatory initiative to eliminate open top gravity launched lifeboats for all oceangoing ships in the U.S. commercial fleet. As an immediate interim safety measure, it is recommended Commandant direct all Officers in Charge of Marine Inspection (OCMIs) to conduct a concentrated inspection campaign on all existing vessels outfitted with gravity launched open lifeboats, including a Coast Guard supervised launching and underway operational test of every lifeboat in service. This concentrated inspection campaign should also ensure that companies have adequately identified and addressed the hazards related to operating with open top gravity launched lifeboats in their identified Safety Management System (SMS) risks.*

Action: I concur with the intent of this recommendation. The Coast Guard agrees that open lifeboats should be phased out of operation and supports proposals from vessel owners and operators or legislation to accomplish this. In 1989, the Coast Guard proposed retrofitting all oceangoing vessels with enclosed lifeboats by July 1, 2001 (54 FR 16236). However, due to cost-benefit and competitiveness concerns, and insufficient support at IMO for a similar U.S. proposal, the requirement was removed in the Interim and subsequent Final Rule (61 FR 25276 and 63 FR 52817, respectively). For existing vessels fitted with open lifeboats, the Coast Guard will initiate a concentrated inspection campaign to ensure that the lifeboats remain in serviceable condition. The inspection will include the launching, maneuvering and recovery of open lifeboats, and the review of related SMS procedures.

Safety Recommendation #4 – Indicators for Watertight Closures on Bridge Alarm Panels. It is recommended that Commandant direct a regulatory initiative to require open/close indicators on the bridge of all existing cargo ships, for all watertight closures that are identified as watertight on the conditions of assignment for assignment of load line form for unmanned and cargo spaces. Furthermore, it is recommended that Commandant work with the IMO to amend the applicability of paragraph 3 of SOLAS II-1/13-1 (2015 consolidated) to include all existing cargo ships. This change would require open/close indicators on the bridge of all existing cargo ships, for all watertight closures (e.g., doors, scuttles, fire dampers) that are identified as watertight on the conditions of assignment for assignment of load line form for unmanned compartments and cargo spaces.

Action: I concur with the intent of this recommendation. All cargo ships constructed after 1992 are required to meet damage stability criterion and existing regulations require that most watertight doors, access hatches and external openings be fitted with open/closed indicators on the bridge. However, vessels built before 1992 are not required to meet damage stability criterion and therefore lack regulatory established watertight boundaries. Thus, there is no defined list of “watertight” openings in regulation on which indicators should be fitted. Accordingly, load line conditions of assignment forms do not necessarily identify all watertight fittings (e.g. the load line conditions of assignment form for the EL FARO did not indicate that the cargo hold access/escape scuttles on the 2nd deck were to be watertight fittings). Notwithstanding the absence of damage stability regulations prior to 1992, the concept of watertight integrity has always been fundamental from a ship design and operational standpoint. In the flag state guidance described in the planned action on Safety Recommendation #15 below, the Coast Guard will recommend that companies identify, in their SMS, watertight and weathertight openings which should be remotely monitored, and the circumstances under which they should be opened or closed.

Safety Recommendation #5 – Requirement for Closed Circuit Television (CCTV) Camera Installation in Stowage Areas. It is recommended that Commandant direct a regulatory initiative to require the installation of CCTV cameras to monitor unmanned spaces from the bridge cargo vessels, such as cargo holds and steering compartments. Furthermore, it is recommended that Commandant work with the IMO to create a new requirement to install and utilize CCTV cameras, or other similar technology, in cargo stowage areas on cargo ships.

Action: I concur with the intent of this recommendation. Cargo hold water detection with remote bridge alarms (see Action on Safety Recommendation #1), coupled with existing fire detection requirements, will provide early notification of the most common anomalies and give the crew an opportunity to investigate conditions in the hold. CCTVs could, under certain conditions and space configurations, provide valuable information about the condition of unmanned spaces. The Coast Guard has no objection to the use of CCTVs to supplement other means to monitor the condition of such spaces. If certain unmanned spaces would be inaccessible under adverse weather conditions, other means of monitoring the space may be appropriate, and should be addressed in the Safety Management System risk assessment.

Safety Recommendation #6 – Vessel Weight Change Tracking. It is recommended that Commandant direct a regulatory initiative to require that a company maintain an onboard and shore side record of all incremental vessel weight changes, to track weight changes over time so that the aggregate total may be readily determined.

Action: I concur with the intent of this recommendation. The preferred method to accurately determine the impact of incremental weight changes on a vessel is to conduct a periodic deadweight survey. SOLAS already requires a full deadweight survey for passenger vessels at least every five years. The Coast Guard has attempted to implement these requirements in regulation twice in the past without success. We have contracted with the National Academy of Sciences, Transportation Research Board, Marine Board, to identify and recommend appropriate updates to 46 CFR Subchapter S – Subdivision and Stability to improve its clarity and consistency with internationally recognized standards. In the next revision of Subchapter S, the Coast Guard will again propose requirements for periodic deadweight surveys for all vessels required to undergo a stability test.

Safety Recommendation #7 – Approval of Software for Cargo Loading and Securing. It is recommended that Commandant direct a regulatory initiative to require review and approval of software that is used to perform cargo loading and securing calculations. Furthermore, it is recommended that Commandant work with the IMO to implement international requirements for review and approval of such software.

Action: I concur with the intent of this recommendation. There is no causal link between this casualty and unapproved Cargo Loading and Securing software. However, the Coast Guard agrees that any software used to evaluate cargo loading and securing arrangements must produce results consistent with the Loading Manual, if required, and the Cargo Securing Manual. The responsibility for the accuracy of such software ultimately lies with the company.

Safety Recommendation #8 - Review and Approval of Stability Software. It is recommended that Commandant update policy to address Coast Guard review and approval of stability software, and delegate review and approval authority to ACSs, where appropriate. This should include establishing specific policy and assigning technical requirements for review and approval of stability software by the Coast Guard, which may be required to review and approve such software for vessels that do not fall under the Alternate Compliance Program (ACP) or Navigation and Vessel Inspection Circular (NVIC) 3-97 authorities.

Action: I concur with this recommendation. The Coast Guard will update policies related to both Coast Guard and Authorized Classification Society (ACS) review and approval of stability software.

Safety Recommendation #9 – Float-free Voyage Data Recorder (VDR) Equipped with an Emergency Position Indicating Radio Beacon (EPIRB). It is recommended that Commandant direct a regulatory initiative to require that all VDR capsules be installed in a float-free arrangement, and contain an integrated EPIRB for all domestic vessels currently required to be

equipped with a VDR. Furthermore, it is recommended that Commandant work with the IMO to amend SOLAS V/20 (2015 consolidated) to require this VDR configuration for existing vessels.

Action: I partially concur with this recommendation. U.S. vessels subject to SOLAS must carry a VDR and this requirement was retroactively applied to existing vessels. While the requirement to carry a VDR was applied retroactively, the non-mandatory performance guidelines, including those involving float free arrangements and locating signals, were not. VDR performance guidelines vary based on a vessel's date of construction. The most recent VDR performance guidelines apply to installations after July 1, 2014, and include criteria for float free medium. The Coast Guard supports the current SOLAS VDR carriage requirements and performance guidelines for existing vessels, and will propose at IMO that all new VDR installations be *required* to float free and contain appropriate means to indicate location, which may include an integrated EPIRB.

Safety Recommendation #10 – Locating and Marking Objects in the Water. It is recommended that Commandant direct an examination of the reliability rate of SLDMBs and other similar technology used during Coast Guard Search and Rescue operations. Additionally, the Coast Guard should develop pre-deployment protocols to conduct circuit testing on beacons prior to deploying them on-scene.

Action: I concur with the intent of this recommendation. The Coast Guard already has a program to evaluate the reliability of Self-Locating Datum Marker Buoys (SLDMBs) on a continual basis. The previous version of the SLDMB, which was in use by the Coast Guard at the time of the casualty, had a success rate ranging from 30% to 50%, depending on the manufacturing batch. Those devices have been taken out of service and replaced with the latest version, which has demonstrated a success rate of 92%. SLDMBs are commercially designed and produced. The Coast Guard will continue to work with manufacturers to improve SLDMB functionality and increase their reliability, and will explore the possibility of pre-deployment self-testing capability.

Safety Recommendation #11 – Attachable Beacon for Assisting in Relocating Search Objects that are Initially Unrecoverable. It is recommended that Commandant identify and procure equipment that will provide search and rescue units the ability to attach a radio or Automated Identification System/strobe beacon to a found search object that is not immediately retrievable. This beacon should be able to be quickly activated and attached to the object, and have a lanyard of sufficient length to keep the beacon on the surface of the water if the object sinks below the surface.

Action: I concur with this recommendation. The ability to mark and track the position of floating objects in the water would benefit several Coast Guard missions. While not designed for this purpose, existing Coast Guard policy provides for the use of SLDMBs to mark such objects. The Coast Guard has identified several products that are better suited for tracking unrecoverable objects and is currently evaluating acquisition options.

Safety Recommendation #12 – Personal Locator Beacon Requirement. It is recommended that Commandant direct a regulatory initiative to require that all Personal Flotation Devices on oceangoing commercial vessels be outfitted with a Personal Locator Beacon.

Action: I concur with the intent of this recommendation. The Coast Guard recognizes the importance of timely and accurate detection and location of persons in the water. The Coast Guard is working with various national and international standards development organizations, including the International COSPAS-SARSAT Programme, to identify the best mechanisms for integrating distress signaling and location technology into personal lifesaving appliances. Once an appropriate standard is established, we will consider mechanisms for implementation.

Safety Recommendation #13 – Anonymous Safety Reporting to Shore for Ships at Sea. It is recommended that Commandant direct the development of a shipboard emergency alert system that would provide an anonymous reporting mechanism for crew members to communicate directly with the Designated Person Ashore or the Coast Guard while the ship is at sea. The system would be in place to report urgent and dire safety concerns that are not being adequately addressed onboard the ship or by shore based company resources in a timely manner.

Action: I concur with the intent of this recommendation. There already are requirements which, if followed, provide crew adequate means for contacting shore. As required by the ISM Code, the SMS should have defined levels of authority and lines of communication between, and amongst, shore and shipboard personnel. Also, to provide for the safe operation of the ship, the ISM Code requires a designated person ashore with direct access to the highest level of management. A fully implemented SMS would have provided mechanisms for the crew to report safety concerns. Furthermore, with respect to safety concerns, the Coast Guard, in agreement with the Occupational Health and Safety Administration (OSHA), has authority to protect seafarers from retaliation for filing safety complaints pursuant to 46 USC 2114. Finally, the Maritime Labour Convention (MLC) 2006, requires that companies maintain onboard complaint procedures (MLC Regulation 5.1.5). While the U.S. is not signatory to the MLC, the Coast Guard has created a voluntary compliance mechanism that most U.S. companies operating oceangoing ships have chosen to implement. In fact, while the EL FARO did not hold an MLC Certificate of Voluntary Compliance, such certificates have been issued to numerous other vessels operated by TSI.

Safety Recommendation #14 – National Oceanographic and Atmospheric Administration (NOAA) Evaluation of Forecast Staffing and Products for Maritime Interests. It is recommended that Commandant request that NOAA evaluate the effectiveness and responsiveness of current National Weather Service (NWS) tropical cyclone forecast products, specifically in relation to storms that may not make landfall but that may impact maritime interests. To improve service to marine stakeholders the evaluation should consider the inclusion of past track waypoints for the tropical system for a period of 48 hours and a graphical depiction of the forecast model track of the best performing prediction models.

Action: I concur with this recommendation. The Coast Guard will engage with NOAA regarding their weather forecast products and delivery to ensure optimal service to maritime stakeholders.

Safety Recommendation #15 – Clarification of Flag State Expectations for SMS Implementation. *It is recommended that Commandant direct the development and implementation of policy to make it clear that the Coast Guard has a shared responsibility to assess the adequacy of a company's SMS. This responsibility includes, but is not limited to, assessing identified risks and contingency plans (as described in IMO Resolution A.1072(28)), and ensuring that the duties, authorities, and qualifications of the Designated Person Ashore and other shore side management who support vessel operations while underway are specifically described.*

Action: I partially concur with this recommendation. The responsibilities of the company, the flag state, and any recognized organizations acting on their behalf are sufficiently described in the ISM Code and the guidelines provided in IMO Resolution A.1071(28). The responsibilities, qualifications, training and experience of the DPA are adequately defined in the ISM Code and MSC-MEPC.7/Circ.6. ISM Code (3.2) specifically requires that the company define and document the responsibility, authority, and interrelation of all personnel. While the company is responsible to develop the content of their SMS, the Coast Guard is ultimately responsible to ensure that the requirements of the ISM Code are fully and effectively implemented. The Coast Guard will promulgate supplemental flag state guidance regarding the development, implementation, and verification of SMSs. This guidance will include provisions for assessing identified risks and developing contingency plans for emergency shipboard situations (e.g. heavy weather procedures, damage control information, closure of watertight and weathertight openings, etc.), as well as provisions for the Coast Guard to issue observations and identify potential non-conformities.

Safety Recommendation #16 – Damage Control Information for Existing Cargo Vessels. *It is recommended that Commandant direct a regulatory initiative to require that all cargo ships have a plan and booklets outlining damage control information. Furthermore, it is recommended that Commandant work with the IMO to amend the applicability of SOLAS Chapter II-1/19 (2015 consolidated), to apply to all existing cargo ships, ensuring these ships have the damage control information.*

Action: I concur with the intent of this recommendation. The Coast Guard agrees that all oceangoing ships should be prepared to mitigate the effects of damage incurred at sea. Since 1992, SOLAS has required that comprehensive damage control information be provided aboard cargo ships (see SOLAS 90 regulations II-1/23-1 and II-1/25-8 and SOLAS 2009 II-1/19). The IMO decided not to apply these standards retroactively. Similarly, U.S. ships constructed after 1992 are required to have similar information in their stability booklets in accordance with 46 CFR 170.110, including guidance for the safe operation of the vessel under emergency conditions. The most expeditious means to provide appropriate damage control information aboard ships built before these standards became effective is for the company to include appropriate operational procedures in their SMS. The Coast Guard will address this matter in the flag state guidance described in the planned action on Safety Recommendation #15 above.

Safety Recommendation #17 – Ship Specific Damage Control Competency. It is recommended that Commandant direct a regulatory initiative to update 46 CFR to establish damage control training and drill requirements for commercial, inspected vessels. Furthermore, it is recommended that Commandant work with the IMO to amend SOLAS to establish similar requirements.

Action: I concur with the intent of this recommendation. 46 CFR 11.307 already requires that officers at the management level be trained in advanced stability, and 11.309 requires that officers at the operational level be trained in stability and ship construction. The STCW standards, incorporated by reference in 46 CFR Part 11, specifically require that management level members of the crew aboard seagoing vessels meet the standard of competence in Section A-II/2 of the STCW Code, which includes developing emergency and damage control plans and the handling of emergency situations. In addition, 46 CFR 15.405 requires that each credentialed crewmember must become familiar with the relevant characteristics of the vessel appropriate to his or her duties and responsibilities, including emergency duties and responsibilities, prior to assuming those duties.

Safety Recommendation #18 – Evaluation of Mariner Training Institutions and Coast Guard Merchant Mariner Credentialing Process. It is recommended that Commandant direct a review of the EL FARO VDR transcript and this Report of Investigation, specifically focusing on the effectiveness of the Coast Guard credentialing exams and third party provided training including navigation simulators, heavy weather avoidance, cargo lashing/securing, stability, damage control, and bridge resource management. The Coast Guard should use the review to identify potential areas and competencies needing improvement and expeditiously develop a plan to implement those findings into the mariner credentialing process.

Action: I concur with this recommendation. STCW, as implemented by Coast Guard regulations in 2010 and 2013, already requires competency in voyage planning (to include severe weather conditions), cargo handling and stowage (to include lashing, securing, and stability), responding to emergencies (to include damage control), and bridge resource management. The Coast Guard has already effectively implemented training for these required competencies into the merchant mariner credentialing process. The current training process is sufficient in most areas. However, following a review of the ROI and VDR transcript, the Coast Guard has identified two areas where the process could be improved.

First, the Coast Guard will provide policy guidance to approved maritime training schools offering management level training in advanced meteorology to ensure the curriculum includes the following topics: characteristics of weather systems, including tropical revolving storms; advanced meteorological concepts; the importance of sending weather observations; heavy-weather preparations; use of technology to transmit and receive weather forecasts (such as NAVTEX or weather routing providers); and, ship routing services (capabilities and limitations). Additionally for management level training in advanced ship handling, the Coast Guard will ensure the training includes ship maneuvering using advanced simulators in heavy weather, and launching of lifeboats and liferafts in heavy weather.

Second, the Coast Guard will provide policy guidance to approved maritime training schools offering operational level training in meteorology to ensure it includes the following topics: characteristics of weather systems, weather charting and reporting, importance of sending weather observations, sources of weather information, and interpreting weather forecast products.

Safety Recommendation #19 – Electronic Records and Remote Monitoring of Vessels at Sea. It is recommended that Commandant direct a regulatory initiative to require electronic records and periodic electronic transmission of records and data to shore from oceangoing commercial ships. This requirement would include records such as bridge and engine room logs, Standards of Training Certification and Watchkeeping (STCW) records, significant route changes, critical alarms, and fuel/oil records. The regulation should ensure Coast Guard access to these records regardless of their location. Furthermore, it is recommended that Commandant work with the IMO to amend SOLAS to require this same electronic transmission of records from all oceangoing commercial ships.

Action: I do not concur with this recommendation. The findings of this investigation do not provide sufficient justification for the recommended action.

Safety Recommendation #20 – Prevention Training Course for Prospective Coast Guard Sector Commanders and Deputies. It is recommended that Commandant explore adding an OCMI segment to Training Center Yorktown's Sector Commander Indoctrination Course for prospective officers who do not have the Prevention Ashore Officer Specialty Code, OAP-10. The recommended OCMI training segment would be similar to the additional Search and Rescue (SAR) Mission Coordinator Course that is currently required for prospective Sector Commanders and Deputies who lack previous SAR experience.

Action: I concur with this recommendation. Although there is a segment on OCMI authorities in the existing Sector Commander's indoctrination course, the Coast Guard will expand and enhance this training and related qualification procedures as necessary to ensure that Sector Commanders, or their designee, are qualified, fully understand their responsibilities, and are equipped to properly discharge or delegate their OCMI authorities.

Safety Recommendation #21 – Coast Guard Oversight of ACSs that Conduct ACP Activities. It is recommended that Commandant update NVIC 2-95 and Marine Safety Manual Volume II to require increased frequency of ACS and Third Party Organizations (TPOs) direct oversight by attendance of Coast Guard during Safety Management Certificate and Document of Compliance audits. Additionally, the Coast Guard shall perform a quality audit specific to the ACS representation and performance on U.S. flag vessels. The Coast Guard personnel conducting the oversight should be fully trained and certified to conduct audits, and given clear authority to issue non-conformities to a vessel, company, or ACS.

Action: I concur with this recommendation. In its capacity as the lead agency for the U.S. flag administration, the Coast Guard must maintain adequate oversight of all delegated functions, including those SMS verification functions that have been delegated to an RO. However, rather than arbitrarily increasing oversight frequency, the frequency of Coast

Guard attendance at SMS verifications will be risk based and data-driven. The Coast Guard will enhance its data systems, develop an SMS oversight policy, refine internal risk models, and establish key performance indicators. These indicators will be used to direct additional oversight of ACS performance. In addition, as described in the RO Code, the Coast Guard will establish a process to conduct Vertical Contract Audits to ensure proper execution of delegated functions. Finally, the Coast Guard will ensure that Marine Inspectors are trained in the ISM Code and SMS audits, and will create a process to identify potential nonconformities and refer them to the RO for resolution.

Safety Recommendation #22 – ACP Efficiency and Manageability. It is recommended that Commandant direct a regulatory initiative to revise 46 CFR § 8.430 in order to eliminate the use of U.S. Supplements that currently exist for each ACS authorized to conduct all delegated activities. The regulatory revision should clarify that ACS personnel shall default to 46 CFR requirements in circumstances identified in the Critical Ship Safety Systems Table in the Federal Register on February 13, 1998 (63 FR 7495).

Action: I partially concur with this recommendation. The original intent of the U.S. Supplement was to capture those rules or regulations that existed in the CFR but were not embodied in either the ACS Rules or the international Conventions, or to provide interpretation where certain items were left “to the satisfaction of the Administration.” However, through IMO engagement and convergence of IACS members’ rule sets, the gaps between U.S. regulations and international standards have largely been closed. Further, as additional ACS’s were authorized to participate in the ACP, inconsistency between the supplements of the various ACS’s, multiple versions of the same supplement, and the lack of consistent reviews/updates has led to an anthology of supplements that have created more confusion than clarity. The Coast Guard will work with ACP authorized ACSs to create a single U.S. supplement primarily focused on critical systems.

Safety Recommendation #23 – ACS Accountability and Transparency. It is recommended that Commandant establish and publish an annual report of domestic vessel compliance. This report shall include domestic vessel no-sail rates for each type of inspected subchapter, and a methodology for associating a Coast Guard-issued no-sail control action with an ACS, for vessels found to have deficiencies or major non-conformities that were misclassified, or not previously identified during an ACS-led inspection or survey.

Action: I concur with this recommendation. The Coast Guard will issue an annual domestic vessel compliance report, as recommended. This report will include relevant vessel, ACS and RO performance statistics to ensure full transparency of Coast Guard oversight activities.

Safety Recommendation #24 – ACS Surveyor Performance and Interactions with OCMI. It is recommended that Commandant direct the implementation of a policy requiring that individual ACS surveyors complete an assessment process, approved by the cognizant OCMI, for each type of delegated activity being conducted on behalf of the Coast Guard. The assessment shall ensure vessel surveys and audits meet the Coast Guard marine inspection standard. If an OCMI determines that an ACS surveyor’s performance is substandard, that OCMI should be given the authority to revoke the Surveyor’s authority to conduct surveys on their behalf.

Action: I partially concur with this recommendation. As is true of classification societies working on behalf of any flag administration, ACS surveyors performing delegated functions on behalf of the Coast Guard must be sufficiently trained to apply and determine compliance with relevant standards as interpreted by the flag administration. Under the terms of the RO Code and their individual agreements with the Coast Guard, ACSs are responsible to ensure that surveyors are sufficiently trained. Further, the RO Code specifically requires that flag states verify and monitor the adequacy of RO performance via assessment of their quality management system, to include surveyor training. The Coast Guard will establish a procedure to assess the effectiveness of ACS surveyor training programs, and will implement policy to ensure appropriate corrective actions are taken when the Coast Guard identifies inadequate ACS performance. This policy will include a provision to revoke an individual surveyor's authority to conduct surveys on U.S. Flag vessels. These procedures and policies will be implemented Coast Guard wide to ensure consistency across all OCMI zones.

Safety Recommendation #25 – Competency for Steamship Inspections. *It is recommended that Commandant direct a study to explore adding a Steam Plant Inspection course to the Training Center Yorktown curriculum. The course should be required for Coast Guard Marine Inspectors and made available to ACS surveyors who conduct inspections on behalf of the Coast Guard. The steam inspection course could serve as an interim measure until an Advanced Journeyman Course covering steam vessel inspections is implemented (please see Safety Recommendation #26).*

Action: I concur with this recommendation. The Coast Guard recently created and convened a steam plant inspection training program, and is in the process of refining the course before integrating it into the larger marine inspection training framework and qualification procedures. To further improve knowledge, communication, and coordination between Coast Guard marine inspectors and ACS surveyors, the course will be made available for surveyor enrollment on a space available basis.

Safety Recommendation #26 – Competency for Marine Inspections and ACS Surveyors Conducting Inspections on Behalf of the Coast Guard. *It is recommended that Commandant direct the addition of an Advanced Journeyman Inspector course to the Training Center Yorktown curriculum. The course should cover ACS oversight, auditing responsibilities, and the inspection of unique vessel types. The course should be required for senior Coast Guard Marine Inspectors and made available to ACS surveyors who conduct inspections on behalf of the Coast Guard.*

Action: I concur with this recommendation. The Coast Guard will establish an Advanced Journeyman Inspector course to provide advanced training on alternate inspection programs, third party oversight, auditing principles and other advanced and contemporary topics (e.g., alternative fuels, ballast water management systems, dynamic positioning systems, etc.). To further improve knowledge, communication, and coordination between Coast Guard marine inspectors and third parties, the course will be made available to third party representatives on a space available basis.

Safety Recommendation #27 – Coast Guard Major Conversion Determinations for Vessels. *It is recommended that Commandant direct the review of policies and procedures for making and documenting major conversion determinations, including use of the Precedence Principle.*

Action: I concur with this recommendation. The Coast Guard will conduct the recommended review.

Safety Recommendation #28 – Intact and Damage Stability Standards Review. *It is recommended that Commandant direct a review of current intact and damage stability standards to improve vessel survivability in extreme wind and sea conditions.*

Action: I concur with the intent of this recommendation. The Coast Guard continuously examines the adequacy of intact and damage stability standards. We are participating in IMO's development of second generation intact stability criteria, which considers the full spectrum of wind and sea conditions for critical stability failure modes. With respect to damage stability standards, IMO recently completed its review and revision of SOLAS damage stability standards (Res. MSC.421(98), adopted 15 June 2017). These standards take into account the probability of extreme sea conditions during a flooding casualty. The Coast Guard has contracted with the National Academy of Sciences, Transportation Research Board, Marine Board, to identify and recommend appropriate updates to 46 CFR Subchapter S – Subdivision and Stability. The Coast Guard will consider the independent recommendations of the Marine Board when determining any necessary revisions of intact and damage stability standards.

Safety Recommendation #29 – Applying Intact and Damage Stability Standards to Existing Cargo

Vessels. *It is recommended that Commandant direct a regulatory initiative to require that all existing cargo vessels meet the most current intact and damage stability standards.*

Action: I do not concur with this recommendation. The findings of this investigation do not provide sufficient justification for the recommended action.

Safety Recommendation #30 – Third Party Oversight National Center of Expertise. *It is recommended that Commandant consider creation of a Third Party Oversight National Center of Expertise to conduct comprehensive and targeted oversight activities on all third party organizations and ACSs that perform work on behalf of the Coast Guard. The Center of Expertise should be staffed with Subject Matter Experts that are highly trained inspectors, investigators, and auditors with the capability and authority to audit all aspects of third party organizations. As an alternative, the Coast Guard could add a new Third Party Oversight Office at Coast Guard Headquarters with a similar staffing model as the proposed Center of Expertise. The new Third Party Oversight Office could function similar to the Traveling Inspector Office and report directly to the Assistant Commandant for Prevention Policy.*

Action: I concur with this recommendation. The Coast Guard will consider these and other means to monitor the global performance of the U.S. flag fleet and the ACSs/ROs that

perform delegated functions on our behalf and implement any necessary changes to our organizational structure and related authorities, roles and responsibilities.

Safety Recommendation #31 – Technical Review of Critical Propulsion System Components. It is recommended that Commandant immediately review a representative sample of existing engineering system plans and implement a policy to ensure future Coast Guard or ACS reviews of such plans consider the full designed operating range when reviewing design elements for critical propulsion system components (e.g., the operating range for lube oil systems should ensure satisfactory function for the full range of allowable oil sump levels and vessel lists.)

Action: I concur with the intent of this recommendation. The SOLAS, ACS and Coast Guard standards for minimum angles of inclination at which machinery must be designed to operate have been in place for many years. There is no compelling evidence to suggest that U.S. vessels are not designed in compliance with these standards, or that the standards require revision. Regardless, these standards cannot guarantee that machinery will function as intended under the conditions actually experienced in service. These standards only require that certain static heel and trim conditions not interfere with the machinery's operation. The actual performance of such engineering systems is highly dependent on their particular design and configuration, the seakeeping characteristics of the vessel in which they are installed, and the crew's routine and engineering casualty control procedures. Only through operational experience can the limitations of these systems be determined. To reduce the potential for similar casualties, the Coast Guard will publish a Marine Safety Alert to inform maritime operators of the MBI's findings regarding the role that main propulsion lube oil sump level played in this casualty. The Alert will recommend that operators verify compliance with minimum SOLAS, Class and regulatory standards, and ensure that their operating procedures address critical propulsion system limitations and actions that should be taken to mitigate the consequences when those limitations are exceeded.

Administrative Recommendation #1 – Acquiring DNA Sample for Identification of Human Remains. It is recommended that Commandant direct the development and implementation of Coast Guard policy for the collection of DNA samples by Coast Guard personnel when deceased individuals are unable to be recovered during Search and Rescue cases or post-incident marine casualty investigations. These DNA samples could be used to provide identification of human remains.

Action: I do not concur with this recommendation. The Coast Guard believes it is important to properly identify and honor the deceased whenever possible. However, Search and Rescue operations are inherently dynamic and time sensitive, and it is impracticable for the Coast Guard to collect DNA samples from human remains during ongoing Search and Rescue operations. However, as noted in the action that will be taken in response to Safety Recommendation #11 above, I will pursue the capability to mark human remains in the water so that they may be relocated and addressed when operations permit.

Administrative Recommendation #2 – VDR Performance Standards. *It is recommended that Commandant direct a regulatory initiative to require that all VDRs capture all communications on ship's internal telephone systems. Furthermore, it is recommended that Commandant work with the IMO to amend SOLAS and update performance standards to ensure that all VDRs capture these two-way internal ship communications.*

Action: I partially concur with this recommendation. VDR performance guidelines are prescribed by IMO, and U.S. vessels subject to SOLAS must carry a VDR. The Coast Guard will propose to IMO that additional data sources be captured by the VDR, including all communications between shipboard control stations, rather than pursuing a domestic regulatory initiative.

Administrative Recommendation #3 – VDR Data and Audio Access. *It is recommended that Commandant initiate a Legislative Change Proposal to amend 46 U.S.C. Chapter 63, to ensure that, notwithstanding NTSB statutory authority, the Coast Guard has full access and ability to use VDR data and audio in marine casualty investigations, regardless of which agency is the investigative lead.*

Action: I concur with this recommendation. The Coast Guard will pursue the recommended Legislative Change Proposal.

Administrative Recommendation #4 – MISLE Documentation of Deficiencies that the OCMI refers to an ACS. *It is recommended that Commandant require the addition of specific MISLE data fields for documenting deficiencies that the OCMI refers to an ACS for correction. The deficiency should remain open in MISLE until the ACS provides the OCMI who issued the deficiency with a written report documenting corrective action has been completed or the condition has been appropriately recorded in the Class database. This will ensure that vessel compliance history is documented and accessible to Coast Guard Marine Inspectors and investigators.*

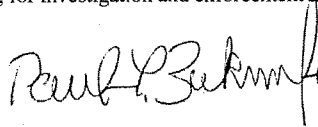
Action: I concur with this recommendation. The Coast Guard will upgrade and enhance the Marine Information for Safety and Law Enforcement (MISLE) system to support the recommended features in addition to others that will allow us to capture, track and analyze key data, including deficiencies issued by Marine Inspectors to vessels enrolled in the ACP. In addition, these features will support trend analysis across the inspected vessel fleet as well as the establishment and monitoring of key performance indicators for third party organizations that perform delegated functions on behalf of the Coast Guard.

Enforcement Recommendation #1 - It is recommended that Sector Jacksonville initiate civil penalty action against TSI for the following offenses:

- *Failure to comply with the work-rest requirements detailed in 46 U.S.C. § 8104 and 46 CFR § 15.1111 for EL FARO crew members on multiple dates prior to the accident voyage.*

- *Failure to comply with emergency procedures for special personnel detailed in 46 CFR § 199.180. Specifically, Polish ship rider Mr. Marek Pupp testified that he continued to conduct work on EL FARO during the emergency muster and abandon ship drills.*
- *Failure to notify the Coast Guard or ABS of repairs to primary lifesaving appliances that were conducted on September 28, 2015 just prior to EL FARO's departure from Jacksonville on the accident voyage and on July 7, 2015, while at sea, EL YUNQUE effected repairs to a non-operable diesel powered lifeboat.*
- *Failure to notify the Coast Guard or ABS of repairs to EL FARO's main propulsion boiler superheating piping on August 24, 2015.*

Action: I concur with this recommendation. The investigation has determined that there is evidence that TSI may have committed multiple violations of law or regulation. As such, the alleged violations identified in this recommendation will be referred to the Officer in Charge, Marine Inspections, Jacksonville, for investigation and enforcement action, as appropriate.



PAUL F. ZUKUNFT
Admiral, U.S. Coast Guard

Enclosure (1) Response to Comments on the Coast Guard EL FARO Report of Investigation

Response to Comments on the Coast Guard EL FARO Report of Investigation

The Coast Guard, in an effort to maintain transparency as well as ensure the families and Parties in Interests (PIIs) rights were balanced by the agency, implemented measures that allowed families and PIIs to provide greater input than required in a Marine Board of Investigation (MBI). The Coast Guard published the Report of Investigation (ROI), including findings, analysis, conclusions, and safety recommendations prior to completion of the Commandant's Final Agency Action (FAM). The Coast Guard invited families and PIIs to submit comments on the ROI for consideration by the Commandant.

The Coast Guard received 59 comments from nine entities; including 18 comments that were treated as requests to re-open the investigation pursuant to Coast Guard Marine Safety Manual Volume V, Part A, Chapter 7. The Marine Safety Manual contains general examples for when re-opening an ROI may be appropriate. It also contains general reasons to decline a request to re-open. The MBI is responsible, as the fact finder, for gathering and evaluating the relevant evidence and assigning the appropriate weight to that evidence. Findings of fact must be corroborated by evidence. Conclusions and safety recommendations are developed by the MBI and are based on an adequate analysis of the relevant evidence presented. An ROI makes recommendations; it does not constitute final agency action. For the Coast Guard to reopen the investigation, challenges to findings, causal analysis, conclusions or safety recommendations must be based on overt errors or credible new evidence that bears directly on ROI conclusions. In this case, each request to re-open the ROI was considered but ultimately denied based upon determinations that relevant evidence was adequately evaluated during the original investigation.

As the FAM was developed, the Coast Guard reviewed and considered each comment received. The Coast Guard considered comments on the ROI's findings, causal analysis, conclusions, and recommendations. Although the MBI made safety recommendations, the disposition of those recommendations remains the purview of the Commandant. The comments and the Coast Guard response are summarized below.

1. *The Coast Guard received one comment noting that contrary to a statement in the ROI, Safety Management Certificates (SMCs) are issued to a vessel, not the Company, and that per the ISM Code, vessel audits are performed twice in five years, not annually.* The Coast Guard concurs that the ROI statement is not clear. To clarify, as per Section 13.2 and 13.7 of the ISM Code, the Flag Administration or an organization recognized by the Flag Administration, in this case the recognized organization (RO), is responsible for issuing a Document of Compliance (DOC) to the operating company and an SMC to the vessel operated by that company. The Company Safety Management System (SMS) is subject to annual external audits from the RO at the operating company level through the DOC. The SMC issued to the vessel only requires one intermediate verification audit between the second and third anniversary date of the issuance of the SMC. The Coast Guard considers this comment as an administrative clarification and no further action is needed.

2. *The Coast Guard received one comment noting that contrary to a statement in the ROI, TOTE Services, Inc (TSI) did have a Shoreside Manual which incorporated the SMS requirements of the ISM Code. The Coast Guard concurs. TSI had an extensive list of manuals that in aggregate formed their SMS. These manuals included various shoreside support roles and functions. However, as noted in the FAM, the ROI pointed out numerous failures on the part of TSI to fully implement their SMS. No changes were made to the safety recommendations as a result of this comment.*

3. *The Coast Guard received one comment noting that an ISM auditor is not a consultant. Therefore it is not the auditor's role to provide guidance to the shipowner. The ROI stated that "[a]t the time of the accident voyage the Coast Guard did not require, and ABS provided no guidance on which shipboard emergencies should be considered in the SMS." The Coast Guard partially concurs. The Coast Guard agrees that ISM auditors are not consultants as this would violate the Independence and Impartiality clauses of the RO Code (see RO Code Regulations 2.3 and 2.4, respectively). However, the ROI statement highlights that ABS could have, in its capacity as an auditor, raised an observation regarding potential emergency situations that should be included in an SMS by using the guidance provided in IACS Recommendation No. 41. This comment informed the FAM response to Safety Recommendation #15.*

4. *The Coast Guard received one comment stating that IACS Recommendation No. 41 is a recommended guidance instrument for use by auditors. It is not, however, a mandatory procedural requirement. The ROI stated that "Guidance for International Association of Classification Societies (IACS) Auditors to the ISM Code No. 41 section 8 (2005), provides examples of emergency situations auditors should sample ... ABS, as the Recognized Organization for TSI vessels, is a member of IACS, and should follow the procedures established in IACS Guidance." The Coast Guard partially concurs. IACS Recommendation No. 41 is a guidance instrument. However this comment is dismissive in nature because it fails to account for why the guidance should not be followed. IACS Recommendation No. 41 states: "This guidance is intended for use by IACS Member Societies' auditors when performing certification under the ISM Code, unless the relevant Administration has provided special instructions that indicate otherwise." No further action was taken as a result of this comment.*

5. *The Coast Guard received one comment that took issue with the statement that "ABS external auditors did not engage with TSI management regarding the development of integrated contingency plans ..." The Coast Guard concurs that ABS external auditors are not consultants. No further action was taken as a result of this comment.*

6. *The Coast Guard received one comment that took issue with a statement in the ROI that ABS did not require that the lifeboats be lowered into the water during the last annual survey. The comment stated that an ISM auditor may elect to carry out drills, which would require lowering and release of the lifeboats, but doing so is not required by existing Coast Guard policy or the ISM Code. The Coast Guard partially concurs. Neither the ISM Code nor Coast Guard policy require an ISM auditor to conduct drills. However, ABS surveyors should ensure all boats are lowered and maneuvered at least once every three months according to the ABS Annual Safety Equipment Survey checklist. Ultimately, both the Coast Guard and ABS failed to ensure that the lifeboats were launched and maneuvered as required by SOLAS III/19.3.3.3. The Coast Guard will provide additional guidance to clarify roles and responsibilities for the lowering and release of lifeboats on vessels enrolled in the ACP.*
7. *The Coast Guard received one comment disputing the ROI's finding that as operated and loaded for the accident voyage, El Faro's stability would not have met the stability criteria for a new cargo ship. The vessel did not meet the righting arm criteria for new cargo ships based on limited available area (righting energy) above 30 degrees of heel and an insufficient angle of maximum righting arm. The Coast Guard partially concurs. The comment is accurate that the EL FARO would have met the 2009 SOLAS damage stability criteria. However, it would not have met the 2009 intact stability criteria. No changes were made to the safety recommendations as a result of this comment.*
8. *The Coast Guard received one comment disputing the finding that EL FARO was enrolled in the ACP in 2006, instead stating that EL FARO was enrolled in 2010. The Coast Guard concurs and adopts December 21, 2010 as EL FARO's enrollment date into the ACP. The Coast Guard considers this an administrative clarification that does not materially impact the ROI conclusions or safety recommendations.*
9. *The Coast Guard received one comment regarding testimony by the Coast Guard, stating that the EL FARO was scheduled to be added to the 2016 ACP targeted list due to the occurrence of a crew injury, not because of the age, ship type or any other issue related to the physical condition of the vessel. The Coast Guard partially concurs. The performance monitoring protocols used to generate the targeted vessel list are designed to focus increased Coast Guard compliance efforts on those U.S. vessels and operators most often associated with substandard risk factors, including those related to vessel age, ship type, and marine casualty history, among others. The Coast Guard agrees that a death due to heart attack was errantly included in the risk analysis due to a software error. However, the Coast Guard disagrees that vessel age and ship type were not considered. In fact, these two factors were the leading risk indicators that resulted in the EL FARO being placed at the threshold for inclusion on the targeted vessel list. The Coast Guard ensured that only vessel-related marine casualties were considered in the preparation of the FY 2018 targeted vessel list. The software used to*

automatically generate the targeted vessel list will be updated as part of an upcoming Coast Guard database enhancement.

10. *The Coast Guard received one comment that disagreed with the ROI conclusion that the emergency fire main did not contribute to the flooding in Hold 3. The Coast Guard does not concur with this comment. The ROI gave full consideration to the fire pump as a possible cause of flooding and admitted that "damage to the suction piping would have resulted in flooding...at a substantial pressure and volume" (ROI p. 185). Ultimately, however, the exact nature and extent of damage to the fire pump could not be confirmed. As noted in the ROI, "regardless of the initial source or sources of flooding on EL FARO during the accident voyage, the free surface associated with the floodwater in the cargo holds combined with hurricane force winds and seas would have inevitably resulted in the capsizing of the vessel" (ROI p. 180). However, because of the potential for such damage, it is appropriate to ensure that vital systems and through hull penetrations fitted in cargo holds be protected from physical damage. As noted in paragraph 9 of the FAM, the Coast Guard will consider requiring such protection in future regulatory initiatives.*
11. *The Coast Guard received one comment disagreeing with the ROI conclusion that water was able to enter Hold 3 through the open scuttle, and likely through deteriorated internal structures and open cargo hold ventilation dampers, which compromised watertight integrity. The comment asserts that this conclusion represents a speculative and unwarranted assumption based on the condition observed on the EL YUNQUE. The Coast Guard does not concur and believes it was reasonable for the MBI to make certain assumptions based on the condition of a sister vessel, of similar age, operated by the same company, and engaged in the same trade on the same route.*
12. *The Coast Guard received one comment disagreeing with the ROI conclusion that even after securing the scuttle to Hold 3, water continued to flood into cargo holds through ventilation openings, and also likely between cargo holds through leaking gaskets on large watertight cargo hold doors. The comment asserted that this conclusion constituted a speculative and unwarranted assumption based on alleged Coast Guard observations of the hose testing of watertight doors aboard the EL YUNQUE. The Coast Guard does not concur. It was reasonable for the MBI to make certain assumptions based on the condition of a sister vessel, operated by the same company and engaged in the same trade.*
13. *The Coast Guard received one comment focusing on the role of the auditor that disputed the ROI conclusion that a lack of effective training and drills by crew members, and inadequate oversight by TSI, Coast Guard and ABS, resulted in the crew and riding crew members being unprepared to undertake the proper actions required for surviving in an abandon ship scenario. The comment stated that the ISM Code does not require or even anticipate that the auditor will perform oversight of crew training. The Coast Guard does not concur with the comment.*

The Coast Guard agrees that it is the company's responsibility to train the ship's personnel, including the riding gang, in a working language or languages understood by them (see ISM Code 6.6). However, as the RO that issued the SMC, ABS had a role in ensuring that the company met this requirement during vessel audits. The conclusion in question was supported by evidence within the ROI.

14. *The Coast Guard received one comment disputing the conclusion that there were no domestic regulations or policy for Coast Guard approval of stability software and the Coast Guard had not delegated such approval authority to an ACS. The Coast Guard does not concur. See Safety Recommendation #8 within the FAM. The Coast Guard will update policies related to both Coast Guard and ACS review and approval of stability software.*
15. *The Coast Guard received one comment that took issue with the ROI safety recommendation that the Commandant update policy to address Coast Guard review and approval of stability software, and delegate review and approval authority to ACSs, where appropriate. The commenter advocated for establishing specific policy and assigning technical requirements for review and approval of stability software by the Coast Guard, which may be required to review and approve such software for vessels that do not fall under the Alternate Compliance Program (ACP) or Navigation and Vessel Inspection Circular (NVIC) 3-97 authorities. The commenter asserted that there are existing international requirements for stability software which the Coast Guard has already accepted through its adoption of the entire 2008 IMO Intact Stability Code under the ACP. The Coast Guard concurs with this comment and it was taken into consideration during the development of the FAM's response to Safety Recommendation #8.*
16. *The Coast Guard received one comment supporting the safety recommendation that the Commandant direct a regulatory initiative to require that all cargo ships have a plan and booklets outlining damage control information and expounded on the ROI recommendation to state that the plans or booklets be approved by the Coast Guard or ABS. The Coast Guard partially concurs and agrees that such information is important, but does not support "approval" of such information due to lack of established standards for vessels built prior to 1992. As such, the Coast Guard will include provisions in flag state guidance for development and verification of SMSs for companies to conduct a risk assessment and develop appropriate damage control procedures within the SMS. See the FAM's response to Safety Recommendation #16.*
17. *The Coast Guard received one comment noting that applying current intact and damage stability standards to existing cargo vessels may not be feasible or even possible without major modifications to many vessels in the U.S.-Flagged fleet. The Coast Guard concurs with this comment and addressed it within the FAM's response to Safety Recommendation #29.*

18. *The Coast Guard received one comment asserting that there was conflicting evidence regarding several key aspects of the investigation, and the MBI Report failed to analyze (and in many cases does not mention) significant evidence in direct conflict with its factual and other findings. The Coast Guard does not concur with this comment. The MBI is the finder of fact within the investigation and it is within its purview to assign appropriate weight to each piece of evidence. The purpose of the ROI is not to detail every point and counter point that was raised throughout the course of an investigation, but rather to holistically determine the most likely causal factors and then develop sound safety recommendations.*
19. *The Coast Guard received one comment asserting that many of the conclusions are overly broad and non-specific, and do not cite any particular evidence or specific findings of fact in support. The Coast Guard does not concur with this comment. ROI conclusions may be specific or broad so long as they are supported by some evidence. The MBI is the finder of fact within the investigation and it is within its purview to assign appropriate weight to each piece of evidence.*
20. *The Coast Guard received one comment noting that as a general matter, many of the conclusions presuppose that shoreside managers are (or should be) involved in certain operational aspects and decision making regarding their vessels. Traditionally by practice – and in some cases by law – such decisions are left to the Master’s discretion and overriding authority while at sea, within the bounds of the company’s Safety Management System, and do not involve shoreside management. The Coast Guard partially concurs with this comment. The Coast Guard agrees that the master must always have “overriding authority” to make decisions with respect to safety (ISM Code 5.2), and that the degree to which the company is involved with day to day vessel operation can and will vary depending on the company. However, the conclusion as to whether or not the company should have taken a more active role to assist the master with avoiding extreme weather, is completely within the purview of the MBI to evaluate based on operational norms throughout the industry. Ultimately, this comment was considered in the FAM’s response to Safety Recommendation #15.*
21. *The Coast Guard received one comment that noted, as a general matter, in a number of respects, the MBI Report incorrectly concluded that some event or action did not occur, simply because there was no evidence on the VDR transcript. The Coast Guard does not concur. The MBI’s conclusions were adequately supported by evidence within the ROI.*
22. *The Coast Guard received one comment disputing the conclusion that TSI did not identify and address heavy weather as a risk in its SMS, consistent with the ISM Code and other relevant provisions of law. The commenter requested that the Commandant disapprove conclusion 9.1.1.2 of the ROI, and disapprove similar statements at pages 49 and 119. The Coast Guard partially concurs. While TSI’s*

Operation Manual - Vessel did in fact have a section on heavy weather, it was poorly implemented. It placed the entire responsibility for weather planning and preparation on the master, which is inconsistent with fundamental stated objectives of the ISM Code. According to TSI's former Designated Person Ashore (DPA), the company deliberately abandoned the practice of assisting masters with heavy weather voyage planning, storm system monitoring, and avoidance. In this instance the ship was ultimately guided into a hurricane. Therefore, the conclusion was adequately supported.

23. *The Coast Guard received one comment disputing the conclusion that the Master did not adequately identify the risk of heavy weather when preparing, evaluating, and approving the voyage plan prior to departure on the accident voyage. The commenter requested that the Commandant disapprove conclusion 9.1.1.3 of the ROI. The Coast Guard does not concur. There was adequate evidence to support the conclusion that the master did not adequately identify the risks related to heavy weather.*
24. *The Coast Guard received one comment disputing the conclusion that TSI did not ensure the safety of marine operations and failed to provide shore side nautical operations supports to its vessels. It disputed the conclusion that TSI did not provide adequate support and oversight to the crew of EL FARO during the accident voyage. The commenter requested that the Commandant disapprove conclusions 9.1.1.1 and 9.1.1.6 of the ROI. The Coast Guard does not concur with this comment. These conclusions were adequately supported by the evidence.*
25. *The Coast Guard received one comment disputing the conclusion that the Master, the Chief Mate, and the crew did not ensure that stevedores and longshoremen secured cargo in accordance with the Cargo Securing Manual, which contributed to RO/RO cargo breaking free. The commenter requested that the Commandant disapprove conclusion 9.1.2.7. The Coast Guard does not concur with this comment. The ROI drew this conclusion based upon the fact that CargoMax was routinely used as a loading instrument, which was inconsistent with cargo securing arrangements specified in the approved Cargo Securing Manual.*
26. *The Coast Guard received one comment disputing the conclusion that a lack of effective training and drills by crew members, and inadequate oversight by TSI....resulted in the crew and riding crew members being unprepared to undertake the proper actions required for surviving in an abandon ship scenario. The commenter requested that the Commandant disapprove conclusion 9.1.6.1. The Coast Guard does not concur with this comment. See the response to comment number 13 within this enclosure.*
27. *The Coast Guard received one comment disputing the conclusion that TSI was required to notify ABS or the Coast Guard when maintenance and repairs were performed on the lifeboat winch clutches, prior to departure on September 29,*

2015. The commenter requested the Coast Guard and ABS update the ACP Supplement, and provide clear guidance to owners and operators, regarding the line between routine service, maintenance, and repairs of lifesaving equipment (which are not to be reported to the OCMI) on the one hand, and "extensive repairs or alterations" on the other (which are to be reported to the OCMI). It also requested the Commandant modify the ROI conclusion and recommendation in this regard, including the conclusion regarding there being evidence of acts subject to a civil penalty. The Coast Guard takes no action on this comment at this time. This comment is directed towards potential civil penalty enforcement and will be referred to Sector Jacksonville's OCMI for adjudication.
28. The Coast Guard received one comment disputing the conclusion that there was sufficient evidence of acts subject to civil penalty of "potential violation of 46 U.S.C. § 8106(a)(4) - no safety orientation of Coast Guard approved Basic Safety Training (BST) for the Polish riding crew. The commenter requested that the Commandant disapprove the conclusion. The Coast Guard takes no action on this comment at this time. This comment is directed towards potential civil penalty enforcement and will be referred to Sector Jacksonville's OCMI for adjudication.
29. The Coast Guard received one comment that noted the ROI, in two locations, incorrectly states that that the TMPR Terminal Manager found an error in the CargoMax stability calculations for the departure loading condition on October 1, after EL FARO was reported missing. The Coast Guard concurs with this comment. The Coast Guard acknowledges and adopts the fact that the TMPR terminal Manager was aware of the CargoMax stability calculation error before EL FARO sailed on September 29, 2015, and that he corrected the error in the system on October 1, 2015, after EL FARO was missing. No additional action was taken as a result of this comment.
30. The Coast Guard received one comment that took issue with the ROI language that cited the VDR transcript, stating "[a]t 5:55 AM, the C/M called the Master on a UHF radio and reported a flooded hold on the starboard side with knee deep water." The commenter notes that this incorrectly suggests that the Chief Mate was reporting that the level of water in the hold was knee deep. The actual quote from the VDR transcript starting at 05:55:00.4 is: "(ya got) water against the side just enough to (go/throw/pour) over the edge of scuttle about knee deep (in here) water (rolls) right over." It is clear from this that he is referring to there being knee deep water on the starboard side on Second Deck, and that water was high enough (knee deep) to allow it to pour over the edge/coaming of the scuttle and into Hold 3. The commenter requests that the ROI be corrected. The Coast Guard does not concur with this comment. The language is quoted directly from the EL FARO VDR, and was not taken out of context within the ROI.
31. The Coast Guard received one comment that took issue with the ROI interpretation of the VDR language citing the Chief Engineer who was assigned to supervise the riding crew, who stated at 5:11 AM on October 1, 2015 "I've

*never seen it list like this— you gotta be takin' more than a container stack *. I've never seen it hang like this."* The commenter stated that the ROI was incorrect to interpret the comment to mean that there were lashing failures and leaning containers at this point in the voyage. The commenter requested that the ROI be corrected. The Coast Guard does not concur with this comment. The challenged language is located within the analysis section which required the MBI to interpret evidence and make reasonable conclusions based on the evidence. The MBI analysis was supported by the evidence.

32. *The Coast Guard received one comment that took issue with the ROI's finding that TSI had not established any written policies or checklists to ensure that the tasks performed by the TMPR personnel were completed in the same manner for each vessel port call. The commenter felt this was not correct and ignored evidence that established there were in fact such policies and checklists. The Coast Guard partially concurs. TSI did have written policies and checklists. However, there was also evidence that indicated these were not always followed or even known by all TSI employees. No additional action was taken as a result of this comment.*
33. *The Coast Guard received one comment that took issue with the ROI's analysis that stated "[t]he vehicles in Hold 3 were likely adrift and moving around in Hold 3 for at least 90 minutes while EL FARO was transiting through heavy seas with a starboard list." The commenter noted that by approximately 6:00 AM, the vessel had switched to a port list, and, while the vessel may have been subject to heavy seas in that period, it is not accurate to state the vessel was transiting through heavy seas at a time she was without propulsion. The Coast Guard does not concur with this comment. The challenged language is located within the Analysis section of the ROI, which required the MBI to interpret evidence and make reasonable conclusions based on the evidence. The MBI analysis was supported by evidence.*
34. *The Coast Guard received one comment that noted the ROI detailed six separate "Events," with numerous sub-points under each event which were listed as "contributing factors." The commenter pointed out that the ROI does not list one contributing factor as more important than any other contributing factor although the first event listed is that the EL FARO sailed within close proximity to Hurricane Joaquin. Further, when the Coast Guard published the ROI, it concurrently published on its Coast Guard Maritime Commons official blog that the ROI concluded that "the primary cause" was the decision to navigate El Faro too close to the path of Hurricane Joaquin. The commenter took issue with blog statement and requested that it be addressed in the FAM. The Coast Guard does not concur with the comment and finds that the evidence was adequately evaluated during the course of the investigation. As indicated, the ROI listed the decision to sail near the hurricane as the first event, and while it was not labeled as such, being listed as the first event signaled that it was the "primary" or "initiating" event.*

35. *The Coast Guard received two comments that stated the FAM must make it clear that there was no single primary cause for this incident. Instead, similar to what occurred in the Deepwater Horizon incident, the EL FARO sinking was the tragic result of a series of thirty-eight contributing factors that had a cumulative effect of causing the sinking. The commenters felt that the ROI made conclusions that were unsupported by the facts, and in many instances, contrary to the evidence obtained during the MBI.* The Coast Guard partially concurs. This was a tragedy with many factors contributing to this marine casualty, the most prominent of which was the Master's decision to sail the ship in close proximity to a Category 3 hurricane. As also noted within the FAM, other significant factors included TSI's failure to adequately fulfill their obligations under the ISM Code, ABS's failure to uncover or resolve deficiencies, and the Coast Guard's failure to execute an adequate oversight program. The Coast Guard does not concur that the ROI's conclusions were unsupported by the facts. Each conclusion was supported by evidence considered by the MBI. No additional action was taken as a result of these comments.
36. *The Coast Guard received two comments that stated the ROI failed to include in its findings a complete and accurate account of sworn testimony during the public hearings relating to the Master's professionalism, bridge resource management skills, and strong safety culture. The commenter requested that the ROI be amended.* The Coast Guard does not concur. The evidence was adequately evaluated during the course of the investigation. It is within the purview of the MBI to assign appropriate weight to each piece of evidence. The purpose of the ROI is not to detail every point and counter point raised throughout the course of an investigation, but rather to build the case for the safety recommendations.
37. *The Coast Guard received one comment that noted in 2008 the Coast Guard identified deficiencies and vulnerabilities with applying weather criteria to vessels like the EL FARO (low freeboard, high wind profile, flush deck vessels), but the ROI failed to adequately address these vulnerabilities and the role they played in the loss of the EL FARO. The commenter requested that the ROI be amended to address this issue.* The Coast Guard partially concurs. The ROI was not amended, but this issue was addressed within the FAM's response to Safety Recommendation #28.
38. *The Coast Guard received one comment that stated the ROI failed to adequately address the fact that a significant amount of water entered the vessel through the starboard side scuttle leading to Cargo Hold #3, which was inadvertently left open or unsecured after the Chief Mate and Master ordered the decks secure for heavy weather. The commenter requested that the ROI be amended.* The Coast Guard does not concur. The MBI did consider the impact of water entering Cargo Hold #3. Regardless of "the initial source or sources of flooding...the free surface associated with the floodwater in the cargo holds combined with hurricane

force winds and seas would have inevitably resulted in the capsizing of the vessel"(ROI p. 180).

39. *The Coast Guard received one comment that stated the ROI failed to include in its findings an accurate analysis of the events during the hours between 2000 on September 30 to 0400 on October 1. The commenter requested that the ROI be amended.* The Coast Guard does not concur. The Coast Guard finds that the evidence was adequately evaluated during the course of the investigation.
40. *The Coast Guard received three comments stating that all the safety, administrative and enforcement recommendations should be enacted.* The Coast Guard partially concurs. The Coast Guard's position on each recommendation is included within the FAM. The Coast Guard "concurred", "partially concurred" or "concurred with the intent" of 28 of the 31 safety recommendations within the ROI and "non-concurred" with three. The Coast Guard "concurred" or "partially concurred" with three administrative recommendations and "non-concurred" with one. The Coast Guard "concurred" with the single enforcement recommendation within the ROI.
41. *The Coast Guard received one comment stating that conclusions 9.1.1.8 through 9.1.1.12 are unsupported by the testimony and facts of the investigation and should be removed from the ROI.* The Coast Guard does not concur. The MBI is the finder of fact within the investigation and it is within its purview to assign appropriate weight to each piece of evidence. The conclusions in question were supported by evidence gathered and evaluated by the board and therefore will not be overturned.
42. *The Coast Guard received one comment noting that the last paragraph of the ROI states that the MBI does not recommend any suspension or revocation action against any credentialed mariner, which is in contrast to a response to a reporter's question given by the MBI Chairman. The comment requests that the Coast Guard redact the public statement and issue an apology for misleading the media and placing blame on the Master.* The Coast Guard does not concur with this comment. The ROI recommendation to take no action against any credentialed mariner is not in conflict with the response the MBI Chairman gave to a reporter during the press conference.
43. *The Coast Guard received one comment stating that there should be a several year gap before any Coast Guard officers accept any positions within the shipping industry.* The Coast Guard does not concur. There are multiple laws and regulations that govern the conduct of both civilian and military Coast Guard members as they transition out of Federal Service into non-federal employment. All former Coast Guard members must comply with all federal post-government employment ethics requirements.
44. *The Coast Guard received one comment stating untested computer SAR*

programs should not be launched during hurricane season. The Coast Guard concurs and will review development and deployment scheduling for these systems.

45. *The Coast Guard received one comment disputing the conclusion that TSI did not provide the tools and protocols for accurate weather observations and that the Master and navigation crew did not adequately or accurately assess and report observed weather conditions.* The Coast Guard does not concur. The MBI is the finder of fact within the investigation and it is within its purview to assign appropriate weight to each piece of evidence. The conclusion in question was supported by evidence gathered and evaluated by the board.
46. *The Coast Guard received one comment stating that any penalties sought should be high enough to send a message to the shipping industry of the necessity to comply with statutes and regulations.* The Coast Guard takes no action on this comment at this time. This comment is directed towards potential civil penalty enforcement and will be referred to Sector Jacksonville's OCMI for adjudication. Any resulting penalties will be assessed in accordance with established statutory provisions.
47. *The Coast Guard received one comment that took issue with the generalized conclusion that a lack of effective training and drills by crew members, and inadequate oversight by TSI, Coast Guard and ABS, resulted in the crew and riding crew members being unprepared to undertake the proper actions required for surviving in an abandon ship scenario. The commenter noted that the blanket statement does not take into account the individual experience of some crew members who were quite prepared for the eventual crisis.* The Coast Guard does not concur with this comment. Although individuals may have had different levels of experience, the Coast Guard finds that the ROI conclusion is supported by the evidence.
48. *The Coast Guard received one comment disputing the conclusion that the crew's complacency, lack of training and procedures, and EL FARO's design contributed to the crew's failure to assess whether the vessel's watertight integrity was compromised, since there were many unknowns regarding the exact source of the flooding.* The Coast Guard does not concur with this comment. The MBI is the finder of fact within the investigation and it is within its purview to assign appropriate weight to each piece of evidence. The conclusion in question was supported by evidence gathered and evaluated by the board.
49. *The Coast Guard received one comment noting that NTSB had the Human Performance Factors Group included in their investigation, and that there should have been an expert witness in the field of study of decision making.* The Coast Guard does not concur with this comment. The Coast Guard disagrees that human factors were not adequately considered. The Coast Guard was a party to

the NTSB investigation and participated in all phases of that process. There was a great deal of information shared between the two investigations, and the analysis of human factors played a critical part in the MBI and the ROI.

50. *The Coast Guard received one comment noting that there should be more involvement from shipyards during incident investigations.* The Coast Guard does not concur with this comment in regards to this investigation. Coast Guard Investigating Officers have authority to subpoena testimony and records, including from shipyards. It is up to each Investigating Officer to make a determination as to what evidence is necessary to conduct a thorough investigation.
51. *The Coast Guard received one comment disputing the conclusion that the Master, Chief Mate, and crew did not ensure that stevedores and longshoremen secured cargo in accordance with the Cargo Securing Manual. The commenter noted that testimony showed that the PORTUS stevedores had never seen a Cargo Securing Manual or Lashing Manual, the National Cargo Bureau found that TSI photographic examples for securing were incorrect and that correct angles of securing were not performed by those whose job it is to know that information; to blame the crew, therefore, is unfair.* The Coast Guard does not concur with this comment. While stevedores were hired by TSI to conduct securing operations, the ultimate responsibility for the vessel remained with the Master, the crew and the company. The MBI is the finder of fact within the investigation and it is within its purview to assign appropriate weight to each piece of evidence. The conclusion in question was supported by evidence gathered and evaluated by the board.
52. *The Coast Guard received one comment stating that there needs to be better communications and integrations between deck and engineering officers. Bridge resource management needs to be expanded and all parties should take ship specific refresher courses together. The Masters, the Chief Mates, the bridge officers, the Designated Persons Ashore and the port engineers or ship supervisors need to all sit down in a classroom together.* The Coast Guard does not concur with this comment. The Coast Guard has already implemented the bridge resource management (BRM) and engineroom resource management (ERM) requirements in STCW, and this casualty does not provide objective evidence that the current curriculum is insufficient.
53. *The Coast Guard received one comment stating that shore-side managers need to start taking some of the same classes that Masters are required to take, including basic weather training.* The Coast Guard concurs that designated persons should be adequately trained in accordance with ISM Code and MSC-MEPC.7/Circ.6. This comment was considered in formulating the FAM's response to Safety Recommendation #15.

54. *The Coast Guard received one comment concerning the interruption of the EL YUNQUE inspection.* The Coast Guard concurs that the marine inspectors should have continued their expanded exam. Coast Guard policy states that an expanded exam should be conducted when clear grounds indicate that the ship has not effectively implemented its SMS. Serious material deficiencies constitute clear grounds to expand the exam. This comment was considered in the FAM's response to Safety Recommendation #20.
55. *The Coast Guard received one comment stating a concern that there will be a lack of follow through by the Coast Guard on the safety recommendations. The commenter recommended that there be an independent monitor or ombudsman appointed to ensure compliance with the safety recommendations, and that any punitive fines paid in this case be used to pay for that position.* The Coast Guard does not concur with this comment. While an independent monitor or ombudsman may be required in a criminal case, these costs are born directly by the party rather than paid for by the government and reimbursed through civil penalties. With regard to "follow through," the Coast Guard takes the implementation of these safety recommendations very seriously and is committed to providing sustainable policy, oversight and accountability both internally and externally.

**NATIONAL TRANSPORTATION SAFETY BOARD
RECOMMENDATIONS**

To the U.S. Coast Guard:

1. Revise regulations to increase the minimum required propulsion and critical athwartships machinery angles of inclination. Concurrently, requirements for lifeboat launching angles should be increased above new machinery angles to provide a margin of safety for abandoning ship after machinery failure.
2. Propose to the International Maritime Organization (IMO) that design maximum operating angles of inclination for main propulsion machinery and other critical shipboard equipment be included in damage control documents, stability instruments and booklets, and in the safety management systems for all applicable vessels.
3. Propose to the International Maritime Organization (IMO) that all watertight access doors and access hatch covers normally closed at sea be provided with open/close indicators both on the bridge and locally.
4. Propose to the International Maritime Organization (IMO) that on new and existing vessels, seawater supply piping below the waterline in all cargo holds be protected from impact.
5. Propose to the International Maritime Organization (IMO) to require that new cargo vessels be equipped with bilge high-level alarms in all cargo holds that send audible and visible indication to a manned location.
6. Propose to the International Maritime Organization (IMO) to require that existing cargo vessels be retrofitted with bilge high-level alarms in all cargo holds that send audible and visible indication to a manned location.
7. Propose to the International Maritime Organization (IMO) that any opening that must normally be kept open for the effective operation of the ship must also be considered a downflooding point, both in intact and damage stability regulations and in load line regulations under the International Convention on Load Lines.
8. Require that information regarding openings that could lead to downflooding be included in damage control documents, stability instruments and booklets, and safety management systems for vessels subject to the intact stability criteria of Title 46 *Code of Federal Regulations* 170.170, regardless of the designation or treatment of such openings in intact stability calculations.
9. Propose to the International Maritime Organization (IMO) that existing cargo vessels operating under the International Convention for the Safety of Life at Sea (SOLAS) be required to have damage control plans and booklets on board that meet current standards.

10. Propose to the International Maritime Organization (IMO) that damage control plans and booklets required by the International Convention for the Safety of Life at Sea (SOLAS) be class-approved.
11. Publish policy guidance to approved maritime training schools offering bridge resource management (BRM) courses to promote a cohesive team environment and improve the decision-making process, and specifically include navigational and storm-avoidance scenarios.
12. Require recurring bridge resource management (BRM) training for all deck officers when renewing their credentials.
13. Require that all deck officers, at both operational and management levels, take a Coast Guard–approved meteorology course to close the gap for mariners initially credentialed before 1998.
14. Publish policy guidance to approved maritime training schools offering management level training in advanced meteorology, or in an appropriate course, to ensure that the curriculum includes the following topics: characteristics of weather systems including tropical revolving storms; advanced meteorological concepts; importance of sending weather observations; ship maneuvering using advanced simulators in heavy weather; heavy-weather preparations; use of technology to transmit and receive weather forecasts (such as navigational telex [NAVTEX] or weather-routing providers); ship-routing services (capabilities and limitations); and launching of lifeboats and liferafts in heavy weather.
15. Provide policy guidance to approved maritime training schools offering operational level training in meteorology to ensure that the curriculum includes the following topics: characteristics of weather systems, weather charting and reporting, importance of sending weather observations, sources of weather information, and interpreting weather forecast products.
16. Require that vessels in ocean service (500 gross tons or over) be equipped with properly operating meteorological instruments, including functioning barometers, barographs, and anemometers.
17. Revise Title 46 *Code of Federal Regulations* 170.110 (stability booklet) to require (1) stability instructions, guidance, or data on wind velocity used to calculate weather criteria; (2) list of closures that must be made to prevent unintentional flooding; (3) list of closures that must be made for an opening not to be considered a downflooding point; and (4) righting arm curve (metacentric height [GM]) table to note the angle at which initial downflooding occurs, and add a windheel table for vessel full load displacement or the condition of greatest vulnerability to windheel.
18. Update the guidance in Navigation and Inspection Circular 4-77 (*Shifting Weights or Counter Flooding During Emergency Situations*), based on the

circumstances of the *El Faro* accident, to include a warning that actions by ship personnel intended to correct a list can produce dangerous results if Ro/Ro cargo is already adrift and water has reduced the coefficients of friction for lashed cargo.

19. Conduct a complete review of the Alternate Compliance Program to assess the adequacy and effectiveness of the program.

20. Review and implement training of Coast Guard inspectors and accredited classification society surveyors to ensure that they are properly qualified and supported to perform effective, accurate, and transparent vessel inspections, meeting all statutory and regulatory requirements.

21. Review and revise the policy for major conversion determinations to consider load line (maximum) draft as a principal vessel dimension.

22. At regular intervals, not to exceed 20 years, review all lifesaving appliances on inspected vessels that are required by Title 46 *Code of Federal Regulations*, part 199, and require compliance with current standards.

23. Require that open lifeboats on all US inspected vessels be replaced with enclosed lifeboats that meet current regulatory standards, and freefall lifeboats where practicable.

24. To prevent future errors in converting position data such as occurred in the *El Faro* accident, work with manufacturers of Global Maritime Distress and Safety System (GMDSS) equipment, communication providers, and land earth stations to remove ambiguity from the Inmarsat-C distress alert position reports.

25. Require that all personnel employed on vessels in coastal, Great Lakes, and ocean service be provided with a personal locator beacon to enhance their chances of survival.

26. Modify guidance and training for marine inspectors to ensure that voyage data recorder (VDR) annual performance tests include the replacement of locator beacons prior to expiration and that audio used to evaluate quality is recorded while a ship is under way using its main propulsion unit.

27. Propose to the International Maritime Organization (IMO) to amend resolution MSC.333(90) to specify that "normal operations" are defined as when a ship is under way using its main propulsion unit and to assess voyage data recorder (VDR) problems, including not capturing both sides of internal phone calls on the bridge electric telephone and unrecorded very-high-frequency (VHF) communications, and identify steps to remedy them.

28. If the actions recommended to the National Oceanographic and Atmospheric Administration in Safety Recommendation M-[00-00] establish that the automatic identification system (AIS) is a viable means by which to relay (with

acceptable time delay) meteorological and oceanographic data and metadata from vessels at sea for use by global meteorological authorities, propose to the International Maritime Organization (IMO) that vessels required to use AIS also be equipped with meteorological and oceanographic sensors—including, at a minimum, sensors for barometric pressure and sea-surface temperature—that will automatically disseminate the data at high-temporal resolution via AIS.

29. Propose to the International Maritime Organization (IMO) that vessels under regulations of the International Convention for the Safety of Life at Sea (SOLAS) that are not already automatically disseminating meteorological and oceanographic data by other means be required to manually disseminate such data while at sea via the automatic identification system (AIS) or the Voluntary Observing Ship program at the times of 0000 UTC, 0600 UTC, 1200 UTC, and 1800 UTC.

To the Federal Communications Commission:

30. Require that all US vessels required to carry 406-MHz emergency position indicating radio beacons (EPIRBs) immediately discontinue the use of EPIRBs that are not global-positioning-system (GPS)-enabled.

31. Reserve the designated application-specific message (ASM) frequencies for very-high-frequency (VHF) data exchange system (VDES) use in US territories, as identified in International Telecommunications Union (ITU) recommendation ITU-R M.2092-0, and consistent with international efforts.

To the National Oceanic and Atmospheric Administration:

32. Coordinate with the National Weather Service, vessel operators, automatic identification system (AIS) service providers, and required onboard technology vendors, to perform a “proof-of-concept” project to establish whether AIS, or another suitable alternative, can practically deliver, in a single message (1) meteorological and oceanographic data obtained directly from automated instrumentation and manual observation on board vessels at sea, (2) vessel position and time of observation, and (3) other important metadata, by satellite and land-based receivers, to global meteorological authorities via the Global Telecommunication System with acceptable time delay.

To the International Association of Classification Societies:

33. Recommend to your members to increase the minimum required propulsion and critical athwartships machinery angles of inclination. Concurrently, requirements for lifeboat launching angles should be increased above new machinery angles to provide a margin of safety for abandoning ship after machinery failure.

34. Recommend to your members to require that design maximum operating angles of inclination for main propulsion machinery and critical shipboard equipment be included in damage control documents, stability instruments and booklets, and in the safety management systems for all applicable vessels.
35. Recommend to your members to require that all watertight access doors and access hatch covers normally closed at sea be provided with open/close indicators both on the bridge and locally.
36. Recommend to your members to require that on new and existing vessels, seawater supply piping below the waterline in all cargo holds be protected from impact.
37. Recommend to your members to require that new cargo vessels be equipped with bilge high-level alarms in all cargo holds that send audible and visible indication to a manned location.
38. Recommend to your members to require that existing cargo vessels be retrofitted with bilge high-level alarms in all cargo holds that send audible and visible indication to a manned location.
39. Recommend to your members that any opening that must normally be kept open for the effective operation of the ship must also be considered a downflooding point, both in intact and damage stability regulations and in load line regulations under the International Convention on Load Lines.
40. Recommend to your members that existing cargo vessels be required to have damage control plans and booklets on board that meet current standards.
41. Recommend that your members require that damage control plans and booklets required by the International Convention for the Safety of Life at Sea (SOLAS) be class-approved.

To the American Bureau of Shipping:

42. Enhance training of your surveyors to ensure that they are properly qualified and supported to perform effective, accurate, and transparent vessel surveys, meeting all statutory and regulatory requirements.

To Furuno Electric Company, Ltd.:

43. Update your Global Maritime Distress and Safety System (GMDSS) software to detect and correct user errors when entering ship positions using the global positioning system (GPS).

To TOTE Services, Inc.:

44. Establish standard operating procedures for heavy weather that address operational limitations and oil levels in critical machinery to ensure their continued operation.
45. Establish procedures for opening, closing, and logging all closures that make up a vessel's watertight envelope while the vessel is at sea.
46. Ensure that damage control plans and booklets are aboard all your load-lined vessels, and that officers and crewmembers are trained in their use.

47. Require senior officers to receive formal training approved by the manufacturer in all functions found in installed stability programs, including damage stability modules.
48. Revise your safety management system and bridge resource management programs to contain detailed policies, instructions, procedures, and checklists to mitigate the risks of severe weather to your vessels.
49. Conduct an external audit, independent of your organization or class society, of your entire safety management system to ensure compliance with the International Safety Management (ISM) code and correct noted deficiencies.
50. Require your vessels to be equipped with properly operating meteorological instruments, including functioning barometers, barographs, and anemometers.
51. Institute a formal company process to provide independent weather routing, passage-planning assistance, and vessel position monitoring.
52. Provide formal and recurrent training to your deck officers on the public and commercial weather information systems provided on board each vessel to ensure that the officers are fully knowledgeable about all weather information sources at their disposal and understand the time delays in the information provided.
53. Provide shoreside management and vessel senior personnel with training in the Rapid Response Damage Assessment program and standard operating procedures, to include requirements to conduct annual drills and submit departure stability conditions for each vessel on each voyage.