United States Coast Guard

Report of the Investigation into the Circumstances Surrounding the Capsize of the Liftboat SEACOR POWER (O.N. 1115290) Approximately 7 Nautical Miles South of Port Fourchon, LA in the Gulf of Mexico Resulting in the Loss of 13 Lives on April 13, 2021.

MISLE Activity Number: 7175076
MISLE Case Number: 1256196

U.S. Department of Homeland Security

United States Coast Guard

Commandant
United States Coast Guard

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16732/IIA #7175076
18 May 2023

THE CAPSIZING OF THE COMMERCIAL LIFTBOAT SEACOR POWER (O.N. 1115290) RESULTING IN MULTIPLE LOSSES OF LIFE APPROXIMATELY SEVEN NAUTICAL MILE SOUTH OF PORT FOURCHON, LA IN THE GULF OF MEXICO ON APRIL 13, 2021

ACTION BY THE COMMANDANT

The record and the report of the investigation convened for 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. This marine casualty investigation is closed.

COMMENTS ON THE REPORT

1. The capsizing of the commercial liftboat SEACOR POWER (O.N. 1115290) and the loss of 13 lives was a tragic accident. The families of crewmembers who lost their lives have my deepest sympathies. The Coast Guard will take appropriate action on all that we have learned from this investigation.

2. I want to thank members of the Marine Board of Investigation (MBI) for their hard work and dedication during this investigation. The safety recommendations developed by the MBI promote maritime safety and provide areas of improvement for not only the Coast Guard, but also for the Outer Continental Shelf industry and the National Weather Service (NWS).

3. The MBI developed 16 best practices which detail voluntary actions by both Coast Guard leadership and industry stakeholders that can be taken immediately. The Coast Guard recommends that vessel owners and operators review these best practices and incorporate them into their safety management systems and company policies as appropriate.

4. While there were other factors that contributed to this marine casualty, the major factor was the unexpected severity of the weather front that the SEACOR POWER experienced. Although the NWS did issue a Special Marine Warning, the crew did not receive the warning, and the weather front moved much faster and was far worse than predicted. Shortly after encountering the squall, the crew attempted to lower the legs to hold position until the storm passed. However, the vessel capsized before they were able to complete those actions. This casualty highlights the sometimes dangerous and unpredictable nature of the maritime

environment and underscores the need for mariners to take precautions to lower the risks and vulnerabilities for all operations.

5. Another factor that contributed to the severity of this marine casualty was the time for the Coast Guard to be notified of the casualty. Due to the speed in which the vessel capsized, the crew was unable to make a MAYDAY call. On the day of the casualty, the Coast Guard received a high volume of calls due to the heavy weather system, including multiple Emergency Position Indicating Radio Beacon (EPIRB) alerts. Although an EPIRB was onboard the SEACOR POWER, it did not alert the Coast Guard to the vessel's correct position. The Coast Guard was not notified until another vessel saw the capsized SEACOR POWER after the squall passed. Additionally, despite the Search and Rescue Transponder (SART) being operational, several vessels in the area did not see the SART due to their radar settings. This unexpected failure of lifesaving equipment increased the time for the Search and Rescue (SAR) teams to arrive on scene. Vessel owners and operators and the Coast Guard need to address these notification failures.

6. The MBI identified several areas where the Coast Guard can improve its SAR program. Although the Coast Guard efficiently and effectively performed during this SAR case once notified of this casualty, there is always room for improvement for this vital mission. The Coast Guard will act on the MBI's recommendations and make improvements in capabilities to facilitate SAR efforts in heavy weather conditions.

7. This investigation emphasizes the importance of maritime situational awareness for both the marine industry and the Coast Guard. The Coast Guard will take actions to improve our policies, procedures, and operational capabilities as outlined below. The marine industry should also take appropriate actions to prevent tragedies like this from occurring in the future.

ACTION ON RECOMMENDATIONS

The following are the recommendations from the MBI and Coast Guard final actions based on those recommendations.

Recommendation 1: The Commandant should immediately revise Commandant Instruction 3140.2D (Marine Weather Observation and Reporting) and Commandant Instruction 3140.3D (Coastal Weather Program). The revisions should address the following issues:

- Which Coast Guard units are required to make severe weather radio broadcasts;
- What information is shared in a severe weather radio broadcast;
- When severe weather radio broadcasts are made;
- Which channel(s) are used for severe weather radio broadcasts, including, but not limited to distress channels or channels that are locally required in lieu of distress channels;
- Who is responsible for the decision to send severe weather radio broadcasts;

- How units are expected to balance search and rescue operations with severe weather radio broadcasts;
- How units will quickly receive severe weather radio broadcasts;
- Which Coast Guard units are required to send weather observations to the NWS; and
- How Coast Guard units should send weather observations to the NWS.

Action: I concur with the intent of this recommendation. A Coast Guard working group will be established to review Commandant Instruction 3140.2D (Marine Weather Observation and Reporting) and Commandant Instruction 3140.3D (Coastal Weather Program) to determine the current applicability and gaps of these and other related references and will make any necessary changes based on this recommended action. The working group will also determine if any new references are needed.

Recommendation 2: The Commandant should expedite their current study of liftboat stability, and then immediately use the results of that study to revise liftboat stability regulations. The Commandant should consider the following actions:

- Clearly define applicable stability requirements for liftboats inspected under 46 CFR Subchapter I and Subchapter L.
- Require liftboat stability calculations to evaluate realistic loading conditions and realistic trim conditions.
- Impose additional safety margins to mitigate the risks posed by environmental variability of wind and waves.
- Update the wind speed vs height profile used to calculate wind loads.
- Update wind calculation shape factors for cylindrical legs with racks.
- Provide clear procedures to establish operating restrictions without relying on oversimplified regulatory thresholds.

Action: I concur with this recommendation. The results of the Coast Guard's Research and Development Center (R&DC) stability study are scheduled to be completed in the Fall of 2023. The Coast Guard will use the results of the study to either validate or revise its liftboat stability regulations, with particular focus on the following:

- Definition of applicable stability requirements for liftboats inspected under both Subchapter I and Subchapter L of Chapter I of 46 CFR;
- Requirements for realistic loading and trim conditions to be evaluated in liftboat stability calculations;
- Requirements for safety margins to mitigate the risks posed by wind and wave variability; and
- Establishing procedures to set operating restrictions that do not rely on oversimplified regulatory thresholds.

The Coast Guard will also consider updating the wind speed versus height profile based on references identified in the MBI report. Additionally, technical literature will be reviewed to assess the basis on which wind calculation shape factors can be updated for cylindrical legs with racks. This response will be shared with R&DC for consideration regarding any additional areas of study.

Recommendation 3: The Commandant should immediately require all liftboat owners and operators to reduce the current operating limits for each vessel, in order to provide a temporary additional safety margin while the actions in the previous recommendation are completed. The operating limit changes could include, but are not limited to, changes in wave limits, wind limits, drafts, trim, operating area, or manning.

> **Action:** I do not concur with this recommendation. An immediate reduction in current operating limits for all liftboats is not supported as the MBI determined that the vessel's capsizing occurred in conditions that well exceeded its maximum operating limits. However, the results of the investigation highlight the critical relationship between design criteria and operating limits. As a result, the Coast Guard will use the outcome of the liftboat stability study described in the response to Recommendation 2 and additional analysis to review and update liftboat operating limits, as appropriate.

Recommendation 4: The Commandant should immediately establish a regulation or policy that prohibits offshore workers from riding aboard a liftboat while the vessel is underway unless the vessel meets additional stability requirements to ensure a level of safety equivalent to a crewboat or offshore supply vessel.

> **Action:** I do not concur with this recommendation. Design stability and operating limit criteria of any vessel should ensure the safe operation for the vessel's intended purpose. For liftboats, the intended purpose often includes the safe carriage and transit of offshore workers. As discussed in the response to Recommendation 2, further stability analysis of liftboats will be conducted, and the Coast Guard will continue to assess stability standards as they apply to design criteria and operating limits.

Recommendation 5: The Commandant should consider a new regulation or policy requiring liftboat owners and operators to create a quick reference guide for each vessel. The quick reference guide would establish clear and simple operating information, and could include topics such as wave limits, wind limits, draft restrictions, trim conditions, and emergency procedures for sudden changes in weather or weather that exceeds the vessel's operating limits.

> **Action:** I concur with the intent of this recommendation. A Finding of Concern will be published recommending that owners and operators of liftboats review their operations manuals to ensure they are easily accessible and understood by the crew when making time-sensitive decisions. The Coast Guard will share this recommendation with the National Offshore Advisory Committee (NOSAC) for their consideration and direct them to develop standardized quick reference card templates for liftboats that can be used by the industry. NOSAC has been tasked to consider the SEACOR POWER National Transportation Safety Board (NTSB) report and any available public-facing reports, which will include this ROI once released, and propose recommendations. The Coast Guard will reevaluate this recommendation pending a response from NOSAC regarding any necessary regulatory or policy changes.

Recommendation 6: The Commandant should issue one or more findings of concern to the NWS recommending the following items:

- Identify immediate options for increasing automated weather observation equipment in the highly trafficked areas of Port Fourchon and coastal Louisiana;
- Consider the use of the Emergency Alert System to send special marine warnings to cell phones located in maritime areas;
- Establish industry working groups to collectively identify strategies and/or best practices to increase voluntary weather reporting in the Gulf of Mexico and to ensure this information is provided in a useful, efficient and accurate format;
- Creation of a joint Coast Guard-NWS working group to explore whether there is value in creating a smart phone application that the public could use to provide voluntary weather observations;
- Consider issuing special marine warnings that contain a forecasted range of wind conditions, not just a forecast predicting winds over a certain speed; and
- Establish a working group to evaluate additional methods of describing special marine warning boundaries to the public and/or limiting special marine warning distribution to only the applicable areas.

> **Action:** I concur with this recommendation. The Coast Guard, the National Oceanic and Atmospheric Administration (NOAA), and the NWS have a Memorandum of Agreement (MOA) which formally recognizes the USCG-NOAA/NWS Coordination Liaison Group (UNCLOG). UNCLOG is the principal vehicle through which the agencies coordinate on matters relating to marine weather information. A letter discussing the recommended items and a copy of the report of investigation and safety recommendations will be forwarded to the NWS and UNCLOG for their consideration.

Recommendation 7: The Commandant should issue one or more findings of concern to all liftboat owners and operators stressing the importance of the following items:

- Lashing cargo, cranes, and deck equipment prior to getting underway;
- Taking immediate actions to properly secure all furniture, equipment, stores and other items that could shift in the event of heavy rolls or capsizing;
- Establishing procedures for frequent weather checks in order to monitor for unexpected weather changes while underway;
- Ensuring lifesaving equipment is reasonably spaced throughout the vessel; and
- Conducting liftboat audits while vessels are afloat and/or loading cargo in order to evaluate the crew's actions while preparing to get underway and validate the pre-departure condition is aligned with the operating manual and stability book.

> **Action:** I concur with the recommendation. The Coast Guard will issue a Finding of Concern to liftboat owners and operators stressing the importance of crew familiarity with operating manual requirements with an emphasis on the points raised in this recommendation.

Recommendation 8: The Commandant should issue one or more findings of concern to all commercial vessel owners and operators stressing the importance of the following items:

- Training dispatchers and other individuals on call to know how to handle emergency situations (SMS procedures, quick response cards, or checklists could provide a useful tool for these individuals);
- Providing clear procedures to calculate draft readings, especially if a vessel is listing or if a vessel's draft marks are not aligned with the vessel's baseline; and
- Ensuring that each vessel is equipped with at least two independent methods of obtaining weather forecasts, and that those methods are readily available on the bridge or at the operating station.

> **Action:** I concur with this recommendation. The Coast Guard will issue a Finding Of Concern to draw attention to the recommended points of emphasis. On October 21, 2021, the Coast Guard issued Safety Alert 07-21 *Unexpected Heavy Weather Dangers: Weather Will Change, Whether You Are Ready Or Not!*, which emphasized the importance of vessels having two independent methods of obtaining weather information.

Recommendation 9: The Commandant should direct a concentrated inspection campaign designed to verify proper Emergency Position-Indicating Radio Beacon (EPIRB) registration on all types of vessels. The campaign could provide clear guidance and direction to marine inspectors (foreign and domestic), marine investigators, commercial fishing vessel examiners, cutter boarding teams, station boarding teams, Auxiliarists, and Public Affairs personnel in order to ensure all Coast Guard elements are participating in the campaign.

> **Action:** I concur with this recommendation. The quality and accuracy of the information contained in the Coast Guard's EPIRB registration database is an issue that directly impacts response efforts in the event of marine distress and the Coast Guard has taken several actions to increase the number of accurately registered EPIRBs.
>
> The Office of Boating Safety (CG-BSX) has initiated steps through existing initiatives to inform the recreational boating public on the requirement to register their EPIRBs and to keep the registration up to date. The most recent significant activity was update to the National Boating Education Standard, ANSI/NASBLA 100-2022: *Basic Boating Knowledge – Core* published on 1 June 2022. There is also a campaign that makes April 6th the 406 Beacon Day and encourages registration. The Coast Guard Auxiliary Vessel Safety Check program includes messaging on EPIRBs and Personal Locator Beacons (PLBs) to include registration. CG-BSX will continue to reinforce the message of registration with the recreational boating safety community.
>
> The Office of Search and Rescue is working with NOAA and CG-BSX to develop a business card with a quick reference (QR) Code to be distributed through various Coast Guard interaction with the commercial vessel industry and vessel owners at boat shows, industry days, and other venues.
>
> The Office of Commercial Vessel Compliance (CG-CVC) will continue to confirm EPIRB registration as a part of regular commercial vessel inspections and exams.

Recommendation 10: The Commandant should consider whether there is an opportunity to establish a requirement for vessel owners or operators to provide proof of valid EPIRB registration prior to renewing or obtaining a Certificate of Documentation.

Action: I concur with the intent of this recommendation. However, the Coast Guard believes that existing outreach campaigns described in the response to Safety Recommendation 9 are sufficient to verify EPIRB registration. The Coast Guard also recognizes that NOAA, the federal agency responsible for managing EPIRB registration, has active campaigns to promote and encourage proper registration. Information on registration is posted online at NOAA.gov and NAVCEN.uscg.gov to encourage use and registration of EPIRBs. Labeling and placarding on individual devices is also required to inform users of the regulatory requirement to maintain up to date registrations. The National Vessel Documentation Center reviews documentation such as evidence of nationality, vessel title, and mortgage among other requirements. Validation of EPIRB registration would require a significant regulatory and procedural overhaul to the Center's current systems. The Coast Guard will consider this recommendation in conjunction with future system upgrades.

Recommendation 11: The Commandant should consider whether there is an opportunity to update the U.S. Search and Rescue Satellite Aided Tracking (SARSAT) system so that when the Coast Guard receives notice of an EPIRB activation, the registered user also receives a notice.

Action: I concur with the intent of this recommendation. Upon receipt of an alert by a Joint Rescue Coordination Center (JRCC), beacon owners are then contacted using the contact information provided on the alert message. The technical ramifications of an automatic owner notification must be assessed by the U.S. Search and Rescue Satellite Aided Tracking (SARSAT) Program. The Coast Guard Office of Search and Rescue (CG-SAR) will present this safety recommendation to the U.S. SARSAT Program Steering Group for consideration.

Recommendation 12: The Commandant should consider publishing additional information regarding false EPIRB alerts, including information about the huge costs associated with these false alerts.

Action: I concur with this recommendation. This information is already available on the U.S. Coast Guard Navigation Center's (NAVCEN) website (https://www.navcen.uscg.gov/instructions-for-canceling-false-distress-alert) and the National Oceanic and Atmospheric Administration (NOAA) website (https://www.sarsat.noaa.gov/preventing-false-alerts/). Addressing false alerts is and will continue to be a U. S. Search And Rescue Satellite-aided Tracking (SARSAT) Program priority.

Recommendation 13: The Commandant should consider creating a Memorandum of Understanding or Memorandum of Agreement (MOA) with the Federal Communications Commission (FCC) so that the Coast Guard can enforce the FCC's EPIRB registration requirements. Alternatively, the Commandant should issue clear guidance to all units explaining how to use the authority found in 14 USC 521 to enforce EPIRB registration.

Action: I concur with the intent of this recommendation. The Coast Guard meets with the FCC on a quarterly basis to discuss matters of mutual concern including potential EPIRB enforcement options and a MOA is not considered necessary. Under current procedures, for documented repeated violations of outdated or improper EPIRB registration, the Coast Guard can either initiate a violation case or make a referral to the FCC Enforcement Bureau for enforcement action. The Coast Guard will provide a copy of this investigation to the FCC and raise the issue of potential EPIRB registration enforcement strategies at the next quarterly meeting.

Recommendation 14: The Commandant should take immediate action to improve phone infrastructure and communications capabilities at all District and Sector Command Centers.

Action: I concur with this recommendation. A project to upgrade the Coast Guard's phone infrastructure is underway. This project will align the Coast Guard's infrastructure with the Department of Defense's (DoD) voice over internet protocol (VoIP). This upgrade will give the Coast Guard new capabilities including the ability to provide interoperability with other government agencies. This initiative was commenced in 2019 starting with 46 Coast Guard Command Centers. To date, 16 of the 46 command centers have completed the upgrades to their phone infrastructure. In 2023, contracting has been initiated with Defense Information System Agency (DISA) to upgrade 15 additional command centers. The remaining 15 are projected to be completed by 2024.

Recommendation 15: The Commandant should consider whether there is an opportunity to establish equipment and processes to receive all types of distress alerts in one location, rather than different Coast Guard units.

Action: I do not concur with this recommendation. The Coast Guard follows Global Marine Distress and Safety System (GMDSS) alert procedures for the delivery of distress alerts to the responsible Rescue Coordination Center (RCC) as provided by international guidance (International Maritime Organization (IMO), International Civil Aviation Organization (ICAO), and the International Aeronautical and Maritime Search and Rescue (IAMSAR) Manual). Coast Guard RCCs are responsible for sharing relevant distress event information to the appropriate units when necessary.

Recommendation 16: The Commandant should evaluate options that would allow District and Sector Command Centers to view EPIRB information, Automatic Identification System (AIS) information, and Search and Rescue Optimal Planning System (SAROPS) information in one Common Operating Picture.

Action: I concur with this recommendation. A single, user-friendly interface that ingests, overlays, and displays EPIRB, AIS, and SAROPS in a unified Common Operating Picture (COP) should be available for Coast Guard watchstanders at every Sector, District, and Area Command Center. A single COP would enable Coast Guard watchstanders to assess potential distress situations quickly and efficiently, utilizing information from existing distress alert mechanisms and vessel reporting systems. Execution will likely require system modifications and upgrades to achieve full implementation of all desired functionality. As such, the Coast Guard will continue to

support numerous initiatives to modernize and improve the COP available for Command Centers.

Recommendation 17: The Commandant should consider whether there is a need to provide District and Sector Command Centers with additional means of tracking commercial vessel locations, in order to allow Command Centers to quickly and easily correlate distress alerts with vessel locations.

Action: I do not concur with this recommendation. The existing capabilities available to Coast Guard Command Centers for maintaining awareness of vessel movement through mandated and voluntary methods such as the Long-Range Identification and Tracking system and AIS are sufficient for tracking commercial vessels. Additionally, a new requirement could contribute to watchstander task saturation, which in turn would further degrade performance during high-consequence events.

Recommendation 18: The Commandant should conduct a study to evaluate whether it would be beneficial to create one distress button that links to a variety of different shipboard systems, including, but not limited to, VHF DSC, MF/HF DSC, INMARSAT, and the vessel's general alarm.

Action: I partially concur with this recommendation. A single "red" distress button is a requirement for "Passenger ships" to comply with the Safety of Life at Sea (SOLAS) Convention, Chapter IV, Regulation 6, paragraph. Conversely, the SEACOR POWER was a SOLAS Cargo Ship greater than 500 Gross Tonnage ITC[1] and was not required to have a single distress button. The Coast Guard has the options of pursuing voluntary adoption or implementation of a new carriage requirement for non-SOLAS vessels. Coordination with the FCC on updating the Title 47 USC Part 80 rules may also be required. As a result, this Safety Recommendation will be forwarded to the Distress Signal Collaborative (DISCO) working group at Coast Guard Headquarters for review and any potential actions.

Recommendation 19: The Commandant should create a campaign to educate vessel owners, operators, and crew members on Digital Selective Calling (DSC) procedures and benefits.

Action: I concur with this recommendation. The Coast Guard will continue to educate vessel owners, operators, and crew members on the procedures and benefits of DSC.

The Office of Boating Safety (CG-BSX) recently updated the National Boating Education Standard, ANSI/NASBLA 100-2022: Basic Boating Knowledge – Core, published on June 1, 2022. This update ensures that boat operators receive education on DSC and comparisons with other communications methods. The Coast Guard Auxiliary Vessel Safety Check program also includes messaging for Auxiliarists conducting boating safety exams to educate boaters on DSC to include registration for a Maritime Mobile Service Identity. The Coast Guard published Marine Safety Advisory 01-22 on

[1] Gross Tonnage ITC is defined in 46 CFR 69.9.

Maritime Distress Communication Devices on September 28, 2022, to educate users on all available communication devices, including DSC. In addition, the Coast Guard published Marine Safety Alert 3-23 on March 2, 2023, to educate vessel owners on how to ensure interconnectivity between DSC and Global Position System (GPS) equipment. The Safety Alert and Safety Advisory can be accessed at the following link:

https://www.dco.uscg.mil/Our-Organization/Assistant-Commandant-for-Prevention-Policy-CG-5P/Inspections-Compliance-CG-5PC-/Office-of-Investigations-Casualty-Analysis/Safety-Alerts/

Recommendation 20: The Commandant should conduct a study to assess the usefulness of SARTs, and then use those study results to evaluate whether SARTs should be removed from the domestic and international regulatory requirements. This study could include an assessment of various SART brands, the equipment and equipment settings necessary to receive SART signals, success stories associated with SART use, and costs associated with SART purchase, maintenance, and replacement.

Action: I do not concur with this recommendation. The SART was tested by the manufacturer and the NTSB and was found to operate as designed. The underlying issue was knowing how the SART operates and understanding its limitations. The Coast Guard addressed both in Marine Safety Alert 12-22 and Safety Advisory 01-22, which can be accessed at the following link: https://www.dco.uscg.mil/Our-Organization/Assistant-Commandant-for-Prevention-Policy-CG-5P/Inspections-Compliance-CG-5PC-/Office-of-Investigations-Casualty-Analysis/Safety-Alerts/

Recommendation 21: While awaiting the results of the SART study discussed in Recommendation 20 above, the Commandant should create an internal education campaign focused on training Coast Guard personnel to properly detect and identify SART signals.

Action: I concur with the intent of this recommendation. Although the Coast Guard does not intend to conduct a SART study, the existing SART training will be reviewed for appropriate information, delivery method, and target audience.

Recommendation 22: The Commandant should assess the effectiveness and usefulness of NAVTEX, as discussed in paragraph 9.8.9 above, and then use those results to evaluate changes to the Coast Guard's NAVTEX equipment and processes.

Action: I concur with intent of the recommendation. Navigational Telex (NAVTEX) disseminates maritime safety information and is a statutory requirement. NAVTEX is a legacy system that was installed in 1993 and has well exceeded its 20-year expected service life. The Coast Guard is evaluating the capability and potential courses of action to transition to the next generation Navigational Data (NAVDAT) system.

Recommendation 23: The Commandant should re-evaluate the regulatory requirement that exempts vessels operating between 32 degrees N and 32 degrees S latitude from carrying immersion suits. While water temperatures in some of these areas may remain warm all year

round, water temperatures in some areas of this region can drop to levels that quickly cause hypothermia, especially during winter and spring.

> **Action:** I concur with the intent of the recommendation. The Coast Guard will re-evaluate the statutory and regulatory requirements that exempt vessels operating between 32 degrees N and 32 degrees S latitude from carrying immersion suits. The Coast Guard will consider a legislative change proposal if appropriate and will update regulations accordingly.

Recommendation 24: The Commandant should require all Coast Guard cutters and small boats to carry line throwing guns and train personnel in their use.

> **Action:** I partially concur with this recommendation. All Coast Guard Cutters, with the exception of inland buoy tenders, currently have a line throwing weapon onboard as part of their weapon allowance. Depending on the class of Coast Guard Cutter, it will have a .30 caliber Shoulder Line Throwing Gun or MK87 Line Throwing Kit affixed to an M16 rifle, or both. Personnel train and fire the line throwing weapons quarterly to maintain qualifications and proficiency. Pre-commissioned cutters receive their Shoulder Line Throwing Gun after the cutter has been accepted by the Coast Guard and certified Ready for Operations.
>
> The Coast Guard does not believe that the MBI's findings support the addition of line throwing guns to all small boats at this time.

Recommendation 25: The Commandant should consider a study to assess the usefulness of drones or remote operated life rings for delivering rescue equipment to individuals who are out of reach of a Coast Guard asset.

> **Action:** I partially concur with this recommendation. The Coast Guard agrees that the use of unmanned aircraft systems (UAS), commonly referred to as drones, to deliver rescue equipment to individuals out of reach of a Coast Guard asset should be studied. One example would be delivering a life ring to an individual caught in shoal water inaccessible from a rescue vessel. On March 31, 2023, the Coast Guard released the Unmanned Systems Strategic Plan. The Plan outlines Strategic Goals to integrate unmanned systems into the Coast Guard force structure to support missions such as search and rescue and will guide the Coast Guard as it examines the development of future capabilities. Unfortunately, in this casualty the extreme weather conditions, the severe wind and sea state, as well as the location of the individuals and the orientation of the partially submerged vessel, prevented recovery prior to the vessel capsizing. Currently, unmanned lifesaving systems do not have the capacity, modularity, dexterity, and potentially artificial intelligence necessary to affect such an extreme rescue.

Recommendation 26: The Commandant should consider establishing a policy that creates clear steps and procedures for a Coast Guard Marine Inspector to review and approve liftboat operations manuals each time they are submitted, and then create procedures for documenting the approval and for providing feedback to the vessel owner/operation and any other entity

involved in writing or reviewing the manual. The policy could also include a requirement to re-review liftboat operations manuals at each COI inspection.

> **Action:** I concur with this recommendation. The Coast Guard will develop guidance clarifying the Marine Inspector's role to review and/or approve the operating manual. The guidance will, at a minimum, address the proper level and frequency of review and approval for a liftboat operating manual.

Recommendation 27: The Commandant should evaluate previous SAR cases to determine how many incidents involved underwater rescue and use this information to evaluate whether there is a need for additional measures to prepare Command Centers, Sectors, Cutters, Small Boat Stations, and Air Stations for underwater rescue situations.

> **Action:** I concur with this recommendation. SAR Coordinators should place an emphasis on ensuring units are prepared to carry out SAR Mission Coordinator (SMC) responsibilities with respect to underwater rescues. CG-SAR should review SAR doctrine and policy related to past SAR events involving persons trapped in submerged or overturned vessels to ensure Coast Guard policy reflects this emphasis and make appropriate updates as needed.

Administrative Recommendation 1: The Commandant should release this Report of Investigation to the public immediately, and then generate the Coast Guard's Final Action Memorandum afterwards.

> **Action:** I do not concur with this recommendation. The investigation has been closed in conjunction with issuance of the Coast Guard Final Action Memorandum.

Administrative Recommendation 2: The Commandant should request additional permanent Coast Guard billets to perform the work associated with a Marine Board of Investigation. Alternatively, the Commandant should identify funding and establish a clear process to provide backfills for some or all of the MBI members for at least one year following the convening order. The current practice of assigning members to serve on a MBI as a collateral duty, while they are still required to perform their regularly assigned job, causes extensive delays to all aspects of the investigation process.

> **Action:** I concur with the intent of this recommendation. Over the last several decades, the complexity of marine casualty investigations and the frequency of MBIs has increased. These increases have placed a significant demand on resources, investigation team members and units as a collateral duty. The Office of Investigations and Casualty Analysis (CG-INV) will consider options for enhanced support to future MBIs and reducing the administrative burden currently placed on Board members.

Administrative Recommendation 3: The Commandant should create a working group with NTSB representatives to see if there are any best practices or other options to minimize the duplication of government efforts while still allowing both agencies to conduct separate investigations.

Action: I concur with the intent of this recommendation. The CG-INV will engage with the NTSB's Office of Marine Safety to determine best practices and to evaluate the current Memorandum of Understanding for any appropriate updates that are needed to clarify agency roles.

Administrative Recommendation 4: The Commandant should close this investigation.

Action: I concur with this recommendation. This investigation is closed.

[redacted]

P. W. GAUTIER
Vice Admiral, Deputy Commandant for Operations
U. S. Coast Guard

U.S. Department of Homeland Security

United States Coast Guard

Commandant
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16732
APR 19 2021

MEMORANDUM

From: Scott A. Buschman, VADM [redacted]
DCO

To: T. Phillips, CAPT

Subj: MARINE BOARD OF INVESTIGATION CONCERNING THE CAPSIZING OF THE SEACOR POWER (O.N. 1115290) APPROX. 7 NM SOUTH OF PORT FOURCHON, LOUISIANA, WITH MULTIPLE LOSSES OF LIFE

1. Pursuant to the authority contained in Title 46, United States Code (U.S.C.), Section 6301 and the regulations promulgated thereunder, you are to convene a Formal Marine Board of Investigation consisting of the following membership. The Board will convene as soon as practicable to inquire into all aspects of the subject casualty at such times and places as directed by you.

- CAPT Tracy Phillips, USCG, Chairman
- Mr. [redacted], USCG, Member
- Mr. [redacted], USCG, Member
- LT [redacted], USCG, Legal Counsel
- LT [redacted], USCG, Recorder

2. The Board will thoroughly investigate the capsizing of the offshore supply vessel SEACOR POWER (O.N. 1115290) and the resulting losses of life in accordance with all applicable statutory and regulatory mandates. Upon completion of the investigation, the Board will issue a report to the Commandant with the collected evidence, the established facts, and its conclusions and recommendations. Conclusions and recommendations concerning commendatory actions or misconduct that would warrant further inquiry shall be referred by separate correspondence to the cognizant District Commander for consideration and action. A daily summary of significant events shall be transmitted to Commandant (CG-5PC) while the Board is in formal session.

3. You will complete and submit your investigative report to Commandant (CG-5PC) within 12 months of the convening date. If this deadline cannot be met, a written explanation for the delay and the expected completion date shall be submitted. You are highly encouraged to submit any interim recommendations intended to prevent similar casualties, if appropriate, at any point in your investigation.

4. The National Transportation Safety Board (NTSB) is also charged with the responsibility of determining the cause or probable cause of this casualty by the Independent Safety Board Act of

Subj: MARINE BOARD OF INVESTIGATION CONCERNING THE CAPSIZING OF THE SEACOR POWER (O.N. 1115290) APPROX. 7 NM SOUTH OF PORT FOURCHON, LOUISIANA, WITH MULTIPLE LOSSES OF LIFE

1974 (49 U.S.C. 1901, et. seq.) and may designate a representative to participate in this investigation including any formal hearing sessions conducted by the Board. The NTSB representative may make recommendations regarding the scope of the inquiry, may identify and examine witnesses, and/or submit or request additional evidence.

5. The Commandant (CG-INV) will furnish such funding and/or technical assistance as may be required by the Marine Board when deemed appropriate and within the requirements for the scope of this investigation. Commander, Eighth Coast Guard District, will provide administrative, logistical, and/or legal support as may be required.

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Copy: CG-5P
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16732
June 9, 2022

COMMERCIAL LIFTBOAT SEACOR POWER (O.N. 1115290) CAPSIZING WITH MULTIPLE LOSSES OF LIFE IN THE GULF OF MEXICO ON APRIL 13, 2021

MARINE BOARD'S REPORT

1. Executive Summary

On the morning of April 13, 2021, Liftboat SEACOR POWER was located at the Bollinger Dock in Port Fourchon, LA. The vessel was on charter to Talos and was in port conducting a crew change and loading equipment for a new job. The company emailed a weather forecast to the vessel that morning, and the forecast predicted calm weather for the day. The crew finished loading equipment, and the First Mate got the vessel underway just before 1230. There were 19 people aboard. The vessel reached the Belle Pass jetties (entrance to Port Fourchon) at 1410 and headed south at a speed of three knots. Seven other vessels also departed Port Fourchon between 1200 and 1500 that day.

The same morning, the National Weather Service (NWS) was tracking a line of severe weather, which moved over the New Orleans region around lunchtime. Around 1400, the line of severe weather developed into a wake low and began accelerating to the south. The NWS issued a Special Marine Warning at 1457, which warned mariners of severe thunderstorms and wind gusts of 34 knots or greater in the area where SEACOR POWER was operating. The crew did not receive the warning, and the weather that actually hit that afternoon was moving much faster and was far worse than predicted. The storm caught many experienced mariners off-guard.

At 1519, SEACOR POWER encountered a rain squall, and the winds strengthened significantly for a few minutes, and then went back down. Thirteen minutes later, SEACOR POWER encountered a second squall with white-out conditions and winds that exceeded 80 knots and gusted up to 99 knots. The Master and the First Mate attempted to lower SEACOR POWER's legs to the seafloor in order to hold position until the storm passed, but the vessel heeled to starboard and quickly capsized. There was very little time to react, and only some of the people aboard managed to escape. The waves washed some individuals overboard, and a few people climbed onto the port side superstructure, which remained out of the water.

SEACOR POWER's crew did not have time to send any distress signals. The Emergency Position Indicating Radio Beacon (EPIRB) automatically activated during the capsizing, but a company representative said the vessel was still inport. When the visibility cleared, almost an hour after the capsizing, the Master on a nearby liftboat saw the vessel and immediately made a distress call. The Coast Guard issued an Urgent Marine Information Broadcast and numerous Good Samaritan vessels in the area responded. A civilian helicopter, Coast Guard response boats, and Coast Guard helicopters and airplanes also joined the rescue efforts, but persistent

high winds and seas prevented anyone from reaching the individuals remaining on SEACOR POWER. Six individuals who washed into the water, or entered the water, survived and were rescued that evening.

Between April 13th and April 19th, Coast Guard aircraft, cutters, and small boats searched a total of 9,290 square nautical miles. Two deceased individuals were found during these surface searches. Between April 15th and April 27th, divers hired by Seacor searched the submerged portions of the vessel. The dive teams found four deceased individuals. The remaining seven individuals from SEACOR POWER were never found and are presumed deceased.

The Coast Guard Investigation determined that the biggest factor that contributed to SEACOR POWER's capsizing was the fact that the vessel was caught in unpredicted weather conditions that exceeded the vessel's operating limits. The Investigation also identified a number of other causal factors that contributed to the casualty, along with a number of unsafe actions or conditions that did not contribute to the casualty.

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2. Preliminary Statement

On April 19, 2021, the Coast Guard's Deputy Commandant for Operations (CG-DCO) issued the enclosed convening order directing a Formal Marine Board of Investigation (MBI) to thoroughly investigate the April 13, 2021 capsizing of SEACOR POWER that resulted in the loss of 13 lives.

The Chair of the Marine Board of Investigation (MBI) was Captain Tracy O. Phillips, United Stated Coast Guard (USCG), District Eight Chief of Prevention. The MBI's legal advisor was Lieutenant [redacted], USCG Investigations National Center of Expertise. The members of the MBI were Mr. [redacted], USCG Marine Safety Center and Mr. [redacted], USCG Outer Continental Shelf National Center of Expertise. The MBI's Recorder was Lieutenant [redacted], USCG Marine Safety Unit Houma. The Family Liaison was Chief Warrant Officer [redacted], USCG Marine Safety Unit Baton Rouge, and the Media Liaison was Public Affairs Chief [redacted], USCG District Eight.

This marine casualty investigation was conducted and this report was submitted in accordance with Title 46 Code of Federal Regulations (CFR) Section 4.09, and under the authority of Title 46 United States Code (USC) Chapter 63.

Under Title 46 USC Section 6308, no part of a report of a marine casualty investigation, including findings of fact, opinions, recommendations, deliberations, or conclusions, shall be admissible as evidence or subject to discovery in any civil or administrative proceedings, other than an administrative proceeding initiated by the United States.

The Marine Board of Investigation designated the following parties in interest (PII), in accordance with Title 46 USC Section 6303: the owner of the SEACOR POWER, Falcon Global Offshore II LLC; the operator of the SEACOR POWER, Seacor Marine LLC; the American Bureau of Shipping (ABS); and the First Mate. No other individuals, organizations, or parties were designated as a party in interest.

This report refers to the owner of SEACOR POWER as Falcon Global (in lieu of Falcon Global Offshore II LLC) and refers to the operator as Seacor (in lieu of Seacor Marine LLC).

The MBI held a public hearing at the Courtyard Marriott in Houma, LA from August 2-13, 2021. 30 witnesses testified under oath during the 10 days of hearing. All witnesses appeared as requested, and PII representatives participated throughout the hearing. Witnesses and PIIs cooperated with all investigation requests. No party objected to any testimony or exhibit offered at the hearing.

The National Transportation Safety Board (NTSB) was the lead agency for evidence collection activities involving this investigation. The NTSB participated in the public hearing, and the MBI and NTSB shared all evidence and factual material gathered throughout the course of their investigations. However, the MBI and NTSB worked separately during the analysis phase of their respective investigations in order to prepare independent conclusions and recommendations.

In addition to the Safety Recommendations in Section 11 of this report, the MBI also identified some Best Practices, which are meant as suggestions that could assist vessel owners, operators, crewmembers, response agencies, and other interested parties.

All findings of fact in this report were obtained from evidence presented to the MBI. Each finding of fact was either obtained from the transcript of the public hearing, or a footnote was used to identify the source of the fact. The transcripts and evidence can be at the following website: https://www.news.uscg.mil/News-by-Region/Headquarters/Seacor-Power/

For ease of reference, this report uses SAR Addendum as the abbreviated title for the manual containing search and rescue policy, guidelines, procedures, and information. The actual title of the manual is the Coast Guard Addendum (CGADD) to the United States National Search and Rescue Supplement (NSS), which is a supplement to the International Aeronautical and Maritime Search and Rescue Manual (IAMSAR). It is accessible at the following website: https://www.dco.uscg.mil/Portals/9/CG-5R/manuals/COMDTINST%20M16130.2F.pdf (last visited May 2022).

The findings of fact in this report are separated into different sections. The first section covers the incident timeline, and then the remaining ten sections provide detailed information about specific topics. In order to avoid extensive cross references within the report, some findings of fact are duplicated in both the incident timeline and in the section covering the detailed topic information.

All times listed in this report are in Central Standard Time using a 24-hour format and are approximate.

3. List of Acronyms

A/B	Able Body Seaman
ABS	American Bureau of Shipping
AIS	Automatic Identification System
CEO	Chief Executive Officer
CFO	Chief Financial Officer
CG	Coast Guard
DOC	Document of Compliance
DPA	Designated Person Ashore
EPIRB	Emergency Position-indicating Radio Beacon
EVP	Executive Vice President
GMDSS	Global Maritime Distress and Safety System
GPS	Global Positioning Satellite
HF	High Frequency
INMARSAT – International Maritime Satellite Organization	
ISM	International Safety Management System
LOOP	Louisiana Offshore Oil Port
MBI	Marine Board of Investigatioin (Coast Guard)
MF	Medium Frequency

MODU	Mobile Offshore Drilling Unit
MSC	Marine Safety Center (Coast Guard)
NAVTEX	Navigational Telex
NOAA	National Oceanic and Atmospheric Administration
NTSB	National Transportation Safety Board
NWS	National Weather Service
OS	Ordinary Seaman
OSV	Offshore Supply Vessel
PTO	Power Take Off
SAR	Search and Rescue
SART	Search and Rescue Transponder
SMC	Safety Management Certificate
SOLAS	International Convention for Safety of Life At Sea, 1974, as amended
USCG	United States Coast Guard
USMCC	United States Mission Control Center
VHF	Very High Frequency (Marine Radio)

4. Explanation of Terms

Client: The charterer of the vessel for which the vessel was hired to conduct services.

Company Man: Client representative aboard vessel (TALOS Rep).

Contractor: Third party persons employed on board the vessel to perform certain jobs and tasks. These persons include contracted by either the company, client or both.

Jacked Down: The vessel pads are off the bottom and the vessel's hull is completely floating in the water.

Jacking Down: The vessel is in the process of lifting the legs and the pads off of the bottom and bringing the hull down into the water.

Jacked Up: The vessel pads are on the bottom and the vessel is lifted by its legs with the vessel's hull partially or entirely out of the water.

Jacking Up: The vessel is in the process of being jacked up.

Level Alarm: A distinct alarm that sounds to indicate an out-of-level condition or uneven leg sinkage in the vessel's elevated condition.

Liftboat: An OSV with movable legs capable of raising its hull above the surface of the sea.

Operations Manual: All liftboats should have an approved operations manual, which at a minimum should include those items required in 46 CFR 134.170.

SafetyNET: The system used on INMARSAT equipment to receive marine safety information for navigational areas other than in Sea Area 4.

Sea Areas: Areas of operation for GMDSS.

Severe Thunderstorm Warning: This is issued by the National Weather Service Forecast Office when a thunderstorm can produce hail one inch or larger in diameter and/or winds equal or exceeding 58 miles an hour. Severe thunderstorms can also produce tornadoes.

Small Craft Advisory: Thresholds governing the issuance of small craft advisories are specific to geographic areas, however, most advisories are generally posted for sustained winds or frequent gusts ranging anywhere between 20-33 knot winds and 5-7 foot seas or higher. **Note:** There is no precise definition of a small craft. Any vessel that may be adversely affected by

Small Craft Advisory criteria should be considered a small craft. Other considerations include the experience of the vessel operator, and the type, overall size, and sea worthiness of the vessel.

Soft Tag: The vessel's pads are on the bottom and the vessel is jacked up on its legs with vessel's hull still in the water.

Special Marine Warning: A warning product issued by the NWS Forecast Office for potentially hazardous weather conditions usually of short duration (up to 2 hours) producing sustained marine thunderstorm winds or associated gusts of 34 knots or greater; and/or hail 3/4 inch or more in diameter; and/or waterspouts affecting areas included in a Coastal Waters Forecast, a Nearshore Marine Forecast, or an Great Lakes Open Lakes Forecast that is not adequately covered by existing marine warnings. Also used for short duration mesoscale events such as a strong cold front, gravity wave, squall line, etc., lasting less than 2 hours and producing winds or gusts of 34 knots or greater.

Wake Low: An area of low pressure that can form behind (in the wake of) and area of stratiform rain, and can be associated with very high winds.

Wet Leg: This is the scenario where water enters the leg column through a crack in the leg, which creates an unwanted situation which drastically alters the vessels stability. However, there are rare occasions where some legs are designed to be wet.

5. List of Figures

6. Vessel Involved in the Incident

Figure 1: Photograph of SEACOR POWER departing Port Fourchon on April 13, 2021

Official Name:	SEACOR POWER
Identification Number:	1115290
Flag:	United States
Vessel Class/Type/Sub-Type	Offshore / Offshore Supply Vessel / General Inspected under 46 CFR Subchapter L
Build Year:	2000
Gross Tonnage:	2,276 GT
Length:	166.5 ft (hull) / 234.0 ft (overall)
Beam/Width:	103.0 ft (hull) / 120.0 ft (overall)
This number is incorrect:	129.0 ft
Draft/Depth:	9.75 ft (Load Line) / 13.0 ft
Main/Primary Propulsion:	Four Caterpillar 3508B Engines
Owner:	Falcon Global Offshore II LLC 5005 Railroad Avenue Morgan City, Louisiana 70380 United States
Operator:	Seacor Marine LLC 5005 Railroad Ave Morgan City, Louisiana 70380 United States

Table 1: Vessel Particulars

7. Personnel Involved in the Incident

Relationship to Vessel	Sex	Age	Status
Master	Male	63	Deceased
First Mate	Male	[redacted]	Survivor
Night Captain	Male	[redacted]	Survivor/Injured
Chief Engineer	Male	55	Missing/Presumed Deceased
Assistant Chief Engineer	Male	36	Deceased
A/B 1	Male	[redacted]	Survivor/Injured
A/B 2	Male	37	Missing/Presumed Deceased
A/B 3	Male	55	Deceased
Cook 1 (O/S)	Male	53	Deceased
Cook 2 (O/S)	Male	69	Deceased
Galley Hand (O/S)	Male	62	Missing/Presumed Deceased
Company Man	Male	[redacted]	Survivor
Cardinal Worker 1	Male	30	Missing/Presumed Deceased
Cardinal Worker 2	Male	[redacted]	Survivor
Cardinal Worker 3	Male	35	Missing/Presumed Deceased
Cardinal Worker 4	Male	[redacted]	Survivor
Fugro Worker 1	Male	26	Missing/Presumed Deceased
Fugro Worker 2	Male	31	Deceased
Major Equipment Worker	Male	45	Missing/Presumed Deceased

Table 2: Personnel Involved in the Incident

8. Findings of Fact

8.1 The Incident

8.1.1. In April of 2021, SEACOR POWER was on charter to Talos. On the morning of April 13th, the vessel was located at the Bollinger North dock in the Floatation Canal in Port Fourchon, LA. The vessel was in port conducting a crew change and loading equipment for a new job located in Main Pass Block Number 138.

8.1.2. SEACOR POWER was not tied to the dock; the vessel's three legs were resting on the bottom and the hull was lifted slightly out of the water, with a gangway extending from the bow of the vessel to the dock.

Figure 2: Cropped Image of SEACOR POWER at Bollinger North Dock on April 13, 2021

8.1.3. At approximately 0600, a relief crew boarded SEACOR POWER in order to conduct a crew change. The Master, First Mate and Chief Engineer met with their counterparts to receive updates on the status of the vessel and the vessel's operations. Shortly after the relief crew arrived, the offgoing crew departed the vessel. According to the email reports sent to Seacor that morning and that afternoon, A/B 2, Cook 1 and the Galley Hand remained on the vessel and did not change out on April 13th.[1]

8.1.4. At 0630 the Master held a meeting on the messdeck with the crew. During this meeting, the Master provided an orientation for the crew. The First Mate and the Night Captain stated that the orientation covered crane safety, drills, abandon ship procedures, muster and liferaft locations, and lifejackets. The Company Man stated that the orientation lasted 15-20 minutes and covered crane safety, prohibited areas, muster locations, and lifejackets. Cardinal Worker 2 stated that it was a general orientation that covered prohibited areas and coronavirus (COVID-19) procedures. Cardinal Worker 4 stated that the orientation included a Job Safety Analysis, as well as topics related to crane safety, not going on deck while underway, and muster areas.

8.1.5. Around 0650, Cardinal Worker 4 was moving his belongings to his stateroom, when he tripped on a watertight door combing and injured his shin. He reported the incident to the Master and the Company Man, and he filled out an incident report. Cardinal Worker 4 received basic first aid treatment and stated that he could remain on the vessel. The First Mate completed an incident investigation and finished the incident report.[2] At 0806, the Master emailed the incident report to a Seacor distribution list used for vessel incidents.[3]

8.1.6. Between 0700 and 1200, the crew loaded approximately 10 truckloads of cargo on the main deck of SEACOR POWER. Cargo manifests from Cardinal, Fugro, Supreme Service & Specialty Co., Wellbore Fishing & Rental Tools, Major Equipment, and River Rentals indicate a total weight of 97.1 long tons of cargo.[4] An Able Body Seaman (A/B) used a SEACOR POWER crane to move each item from the Bollinger Dock onto the vessel. As each item was loaded, the A/B decided where to place each item on deck and measured the weight with the crane's load cell. The A/B reported the weight of each item by radio, and the other A/Bs, and at times the First Mate, recorded the weight and location of the cargo loads (the recorded weights and locations were lost in the casualty). Cardinal, Fugro, and Major Equipment personnel assisted with the cargo. The cargo was not secured to the deck of the vessel.

8.1.7. At 0702, the Seacor Dispatcher emailed a weather forecast to the vessel. The weather forecast predicted "moderate choppy seas" for the morning of April 13, with east-southeast winds from 10-14 knots. The forecast also predicted "light SE winds with a slight chop" and "winds SE 9 to 12 knots" for the afternoon.[5]

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[1] Exhibits 137 & 140
[2] Exhibit 102
[3] Exhibit 101
[4] Exhibits 24-30
[5] Exhibit 138

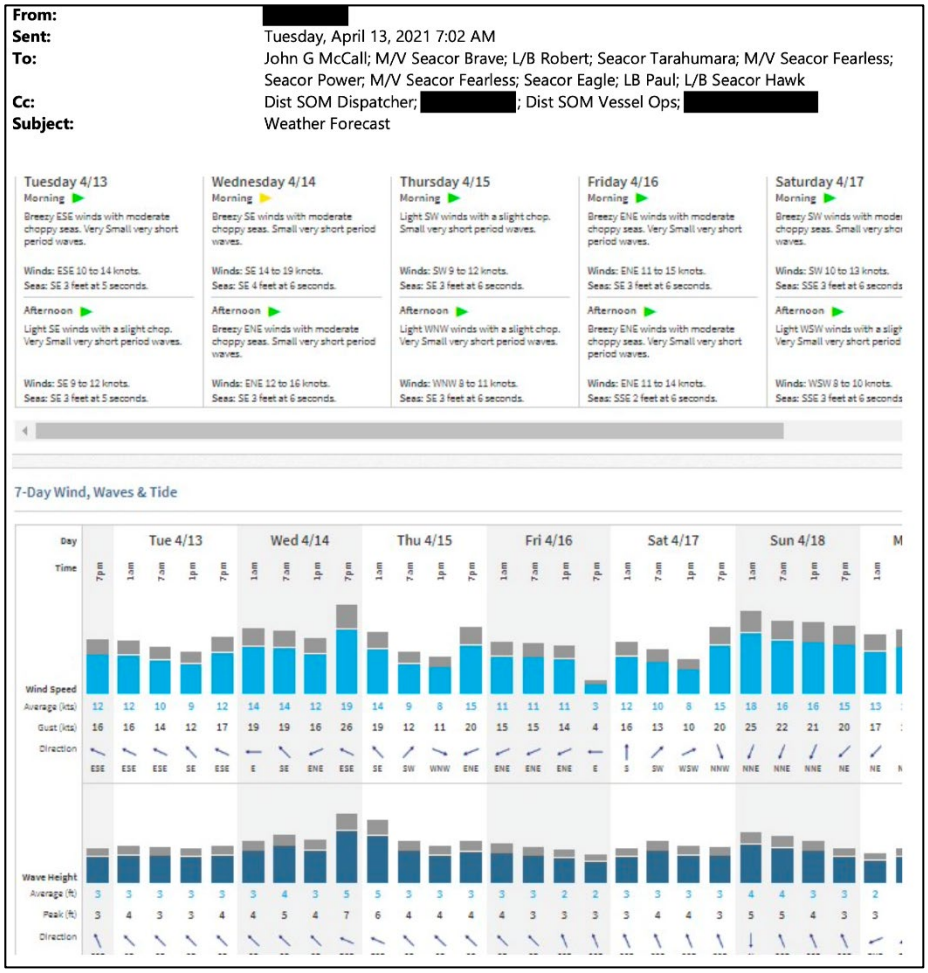

Figure 3: Weather Forecast send on 13 Apr 2021 by Seacor Dispatcher

8.1.8. The Seacor Operations Manager spoke with the Master of SEACOR POWER at approximately 0846 and 1033 on the morning of April 13th. The Master stated that things were going well. During the 0846 call, they discussed the weather for the mid-point of the vessel's planned trackline between Port Fourchon and Main Pass 138. The forecast for that area was three to four foot seas and 15 to 20 knot winds.

8.1.9. At 1208 and 1427, the National Weather Service in New Orleans issued Special Marine Warnings for Barataria Bay (northeast of Port Fourchon). These warnings did not apply to SEACOR POWER's location or planned trackline.

8.1.10. Around 1210, the Master and the First Mate met in the Master's office. The two discussed the weather report that was provided by Seacor that morning. The First Mate recalled that the weather report predicted 2-4 foot seas and 10-15 knot winds.

8.1.11. At 1215, the First Mate made an announcement over SEACOR POWER's public address system, which the crew referred to as the GAI-Tronics. The First Mate stated that all personnel must remain inside while the liftboat is jacking down (moving the legs up, picking the pads off the bottom, and bringing the hull down into the water) and while the vessel is underway.

8.1.12. SEACOR POWER's on-watch (on tower) crew, including the Master, the First Mate, A/B 1, A/B 2, and the Chief Engineer, held a short voyage risk assessment meeting on the bridge prior to getting underway.[6]

8.1.13. At 1217, the First Mate picked up SEACOR POWER's legs, lowering the hull into the water, and the vessel departed Bollinger Dock with 19 individuals aboard. Many of the off-duty crew and contractors went to take naps in their staterooms. A/B 1 reported that Cook 1 was on duty at that time.

8.1.14. Also at 1217, the Master sent an email to Seacor indicating the vessel was jacking down in Port Fourchon and heading to Main Pass 138 with estimated time of arrival at roughly 20-22 hours.[7]

[redacted]

From: Seacor Power [redacted]
Sent: Tuesday, April 13, 2021 12:17 PM
To: Dist SOM Vessel Ops
Subject: Seacor Power Update

WARNING! EXTERNAL SENDER

Jacking down from Bollinger ,Fourchon / Heading to Main Pass 138 , ETA ,Roughly 20-22 HRS / All good / [redacted]

Figure 4: Departure Email from SEACOR POWER Master to Seacor at 1217

8.1.15. At 1223 and 1329, the National Weather Service in New Orleans issued Special Marine Warnings for Lake Pontchartrain and Lake Maurepas (north of Port Fourchon). These warnings did not apply to SEACOR POWER's location or planned trackline.

8.1.16. The Liftboat ROCKFISH was located on the west side of the Bay Marchand field in Block 2. At approximately 1340, the ROCKFISH Master jacked down (moved the legs up, picked the pads off the bottom, and brought the hull down and into the water) and began a two-mile transit from Bay Marchand Block 2 to a fixed platform located in South Timbalier Block 24. The fixed platform was nicknamed "Sugar Dog."

[6] Exhibit 235
[7] Exhibit 139

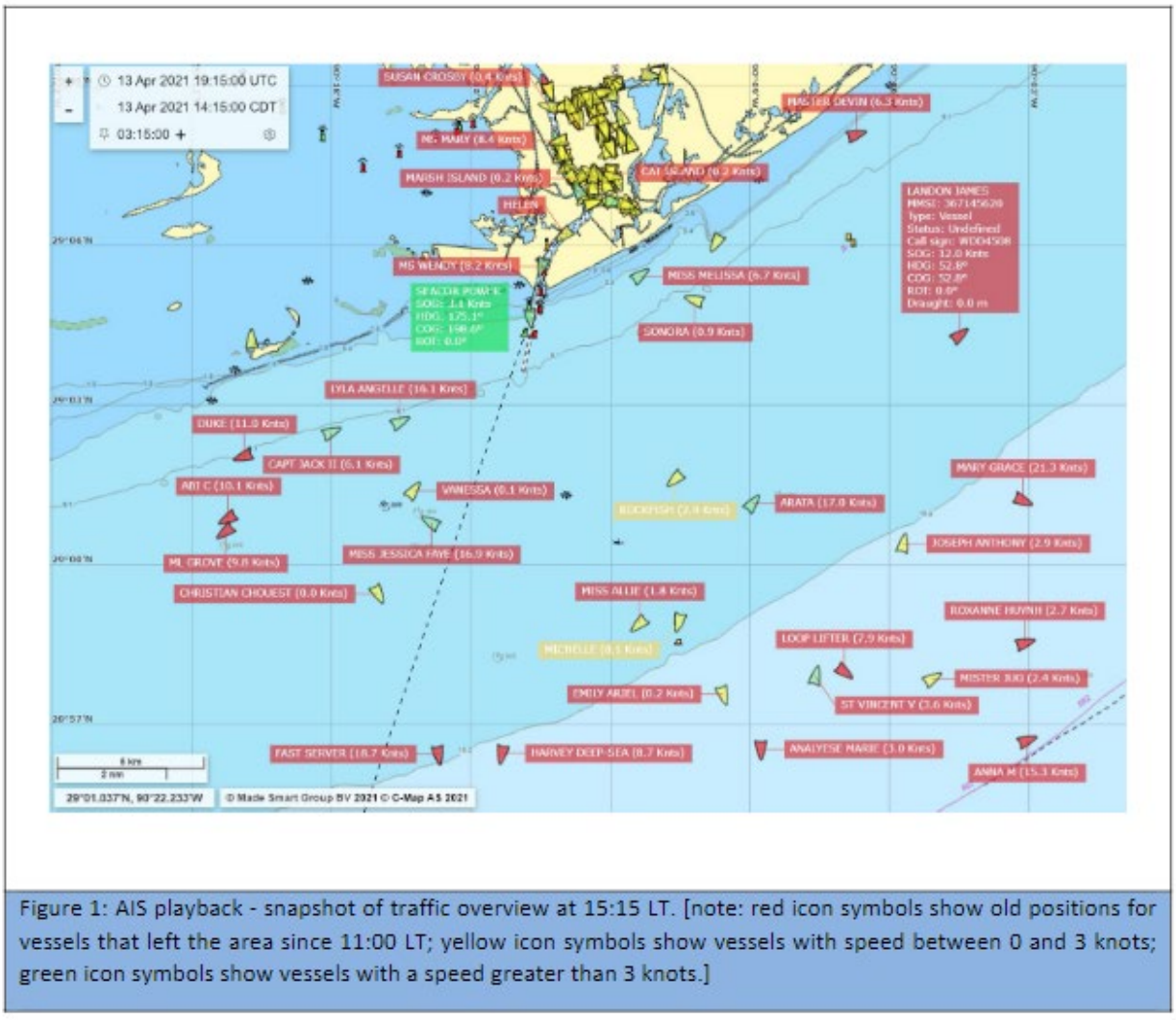

Figure 1: AIS playback - snapshot of traffic overview at 15:15 LT. [note: red icon symbols show old positions for vessels that left the area since 11:00 LT; yellow icon symbols show vessels with speed between 0 and 3 knots; green icon symbols show vessels with a speed greater than 3 knots.]

Figure 5: AIS Animated Data of Vessel Movements near Port Fourchon on April 13, 2021 (Exhibit 124)

8.1.17. At 1400, the USCGC MORAY was moored at Coast Guard Station Grand Isle, LA. The vessel's crew recorded nine knot winds coming from the west.[8]

8.1.18. SEACOR POWER reached the jetties at Belle Pass at 1410. In addition to SEACOR POWER, AIS recorded seven other vessels outbound[9] (going offshore from Port Fourchon) at the Belle Pass Jetties from 1200 to 1500, including the vessels listed in the following table:

[8] Exhibit 242
[9] Exhibit 126

Vessel	Type	Time Outbound at Belle Pass Jetties
HARVEY DEEP-SEA	Offshore Supply Vessel	1211
DUKE	Offshore Supply Vessel	1240
LOOP LIFTER	Offshore Supply Vessel	1246
FAST SERVER	Crewboat	1342
SEACOR POWER	Liftboat	1410
MS WENDY	Crewboat	1419
CGC GLEN HARRIS	Coast Guard Cutter (Pre-commissioned)	1445
HARVEY DISCOVERY	Offshore Supply Vessel	1455

Table 3: Vessel Departures from Port Fourchon

8.1.19. At 1424, SEACOR POWER cleared buoys 1 and 2 in Belle Pass, and headed south at 3 knots.[10] The First Mate observed 10-15 knot winds from the south to southeast. A/B 2 reported to the First Mate that the vessel's watertight doors were closed and dogged tight.

8.1.20. The SEACOR POWER Global Maritime Distress and Safety System (GMDSS) alarm sounded at 1430 and the First Mate noted that the screen said "cannot print." The GMDSS console was located on the port side aft of the wheel house, which was not within reach of the operating station. The First Mate was operating the vessel at the time, and did not address the issue or investigate further.

8.1.21. At 1432, the pre-commissioned Coast Guard Cutter GLENN HARRIS departed the Bollinger Fourchon dock. The vessel was scheduled to be commissioned as a Coast Guard Cutter, but at the time the vessel was still under command of the builder, Bollinger Shipyard. The vessel was operated by a Bollinger Shipyard Captain and crew, and the future Coast Guard crew was aboard in a training capacity.

8.1.22. At 1441, ROCKFISH reached the Sugar Dog Platform (approximately 7 nautical miles south of Port Fourchon)[11] and the Master jacked up (moved the legs down, placed the pads on the bottom, and brought the hull up and out of the water). The ROCKFISH Master observed 15-20 mile an hour winds, 1.5 knots of current moving to the east, and 3 to 5 foot seas.

8.1.23. At 1457, the National Weather Service in New Orleans issued a Special Marine Warning that noted severe thunderstorms north of Port Fourchon, and moving toward SEACOR POWER's location and planned trackline. This warning reported the hazards associated with the storms included wind gusts of 34 knots or greater and large hail.

8.1.24. The First Mate stated that he did not see any Special Marine Warnings on April 13th.

[10] Exhibit 1
[11] Exhibit 124

8.1.25. At 1507 the Master sent an email to Seacor with his evening operations report. The Master noted that the vessel was enroute to Main Pass 138, with a total of 18 persons on board (11 crew and 7 third-party contractors). The report listed the weather as cloudy skies with southeast winds 15-20 miles per hour, 3-4 foot seas, and 3-4 miles of visibility.[12]

8.1.26. At 1510, SEACOR POWER's Helm Connect Engine Room Daily Log was sent to Seacor. The daily log noted the quantity of fuel, oil, and water on board.[13]

8.1.27. At 1510, the GLENN HARRIS arrived at a training location, which was 3 nautical miles southwest of Caminada Pass (6 miles east of Port Fourchon).

Figure 6: Fast Response Cutter GLENN HARRIS

8.1.28. At 1516, the C-Port Drydock West camera, located on the northern edge Port Fourchon, recorded the arrival of a rain squall. This was the first of two squalls to hit.[14]

8.1.29. At 1519, SEACOR POWER encountered a rain squall. The First Mate observed that the wind quickly jumped up to 79 mph and then slowed to 30 to 40 mph. These winds came from the stern of the vessel (from the north). Between 1519 and 1529, SEACOR POWER's speed increased from 2.5 knots to 5.5 knots. At 1529, the speed steadied at 5.5 knots.[15] The First Mate did not increase the vessel's engine speed during this period.

[12] Exhibit 140
[13] Exhibit 86
[14] Exhibit 274
[15] Exhibit 45

8.1.30. At 1521, C-Port Drydock West camera recorded the arrival of a second, stronger squall.[16] The HOS Port North Yard camera, 100 yards west of C-Port Drydock, also recorded the arrival of the second squall. That camera showed zero visibility at the peak of the squall, and recorded intense winds for 108 minutes, or 1 hour and 48 minutes.[17] At 1522, the second squall reached the camera at the Baroid Dock in Bayou Lafourche, 1.5 miles south of C-Port Drydock. The squall was moving south, toward SEACOR POWER.[18]

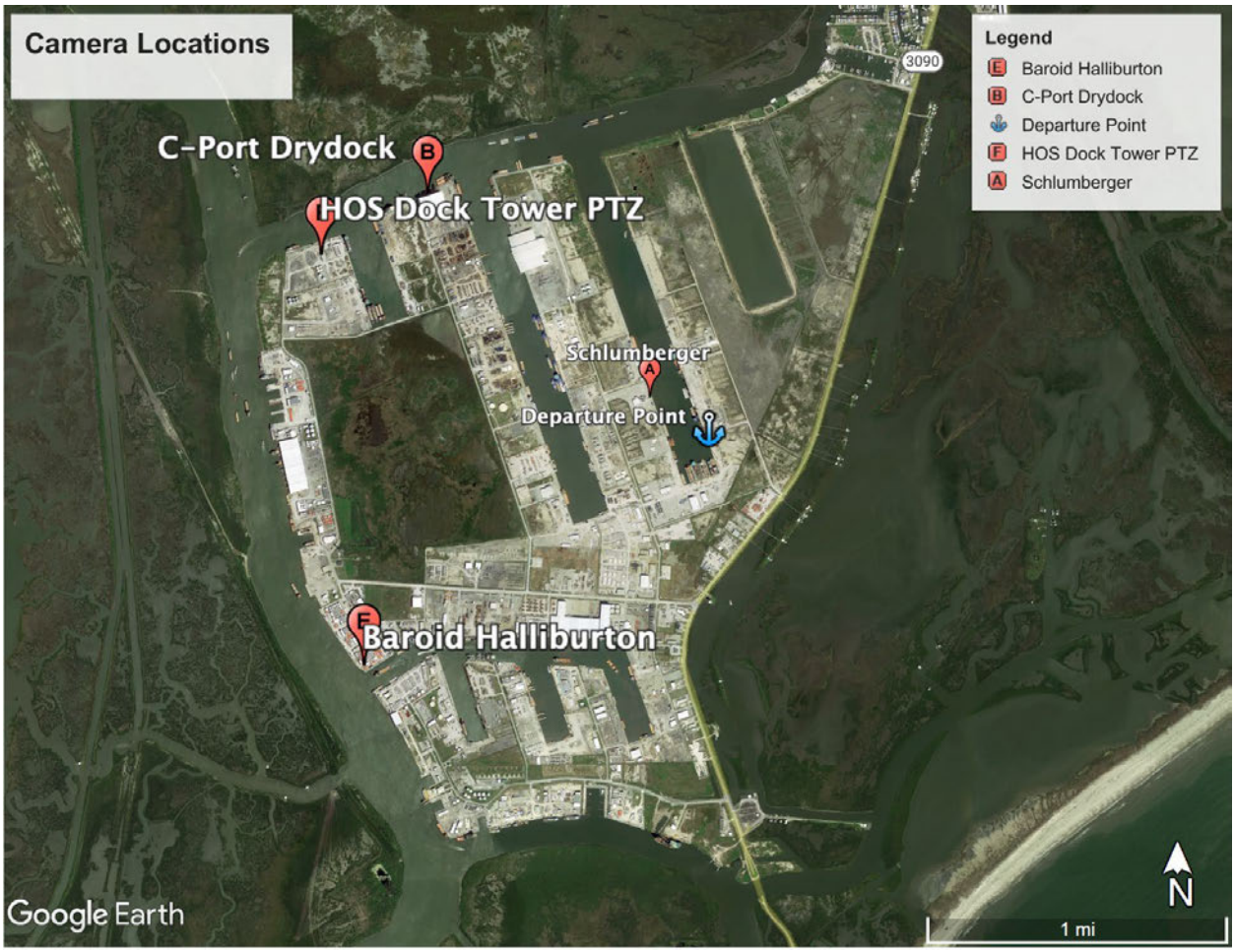

Figure 7: Port Fourchon Camera Locations

[16] Exhibit 274
[17] Exhibit 112
[18] Exhibit 187

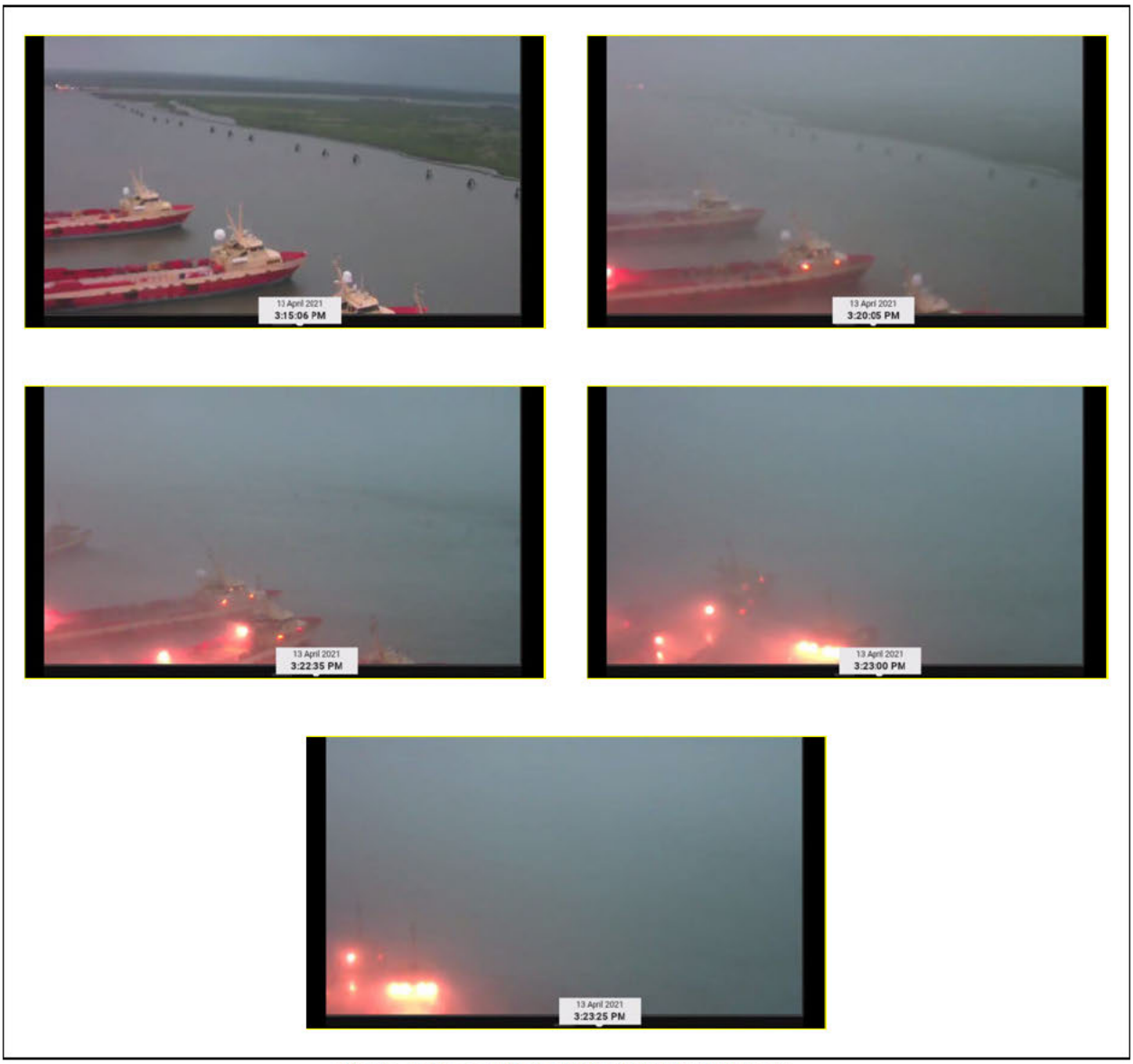

Figure 8: Images from C-Port Drydock Camera

8.1.31. At 1530, the ROCKFISH Master observed wind speeds of 30 to 35 mph that increased to 95 mph.

8.1.32. At 1532, SEACOR POWER encountered the second squall. The First Mate observed white-out conditions, and the visibility reduced from 5-6 miles down to approximately 100 yards (about the length of the vessel). Between 1532 and 1534 the vessel's speed increased from 6 to 8.5 knots.[19]

[19] Exhibit 45

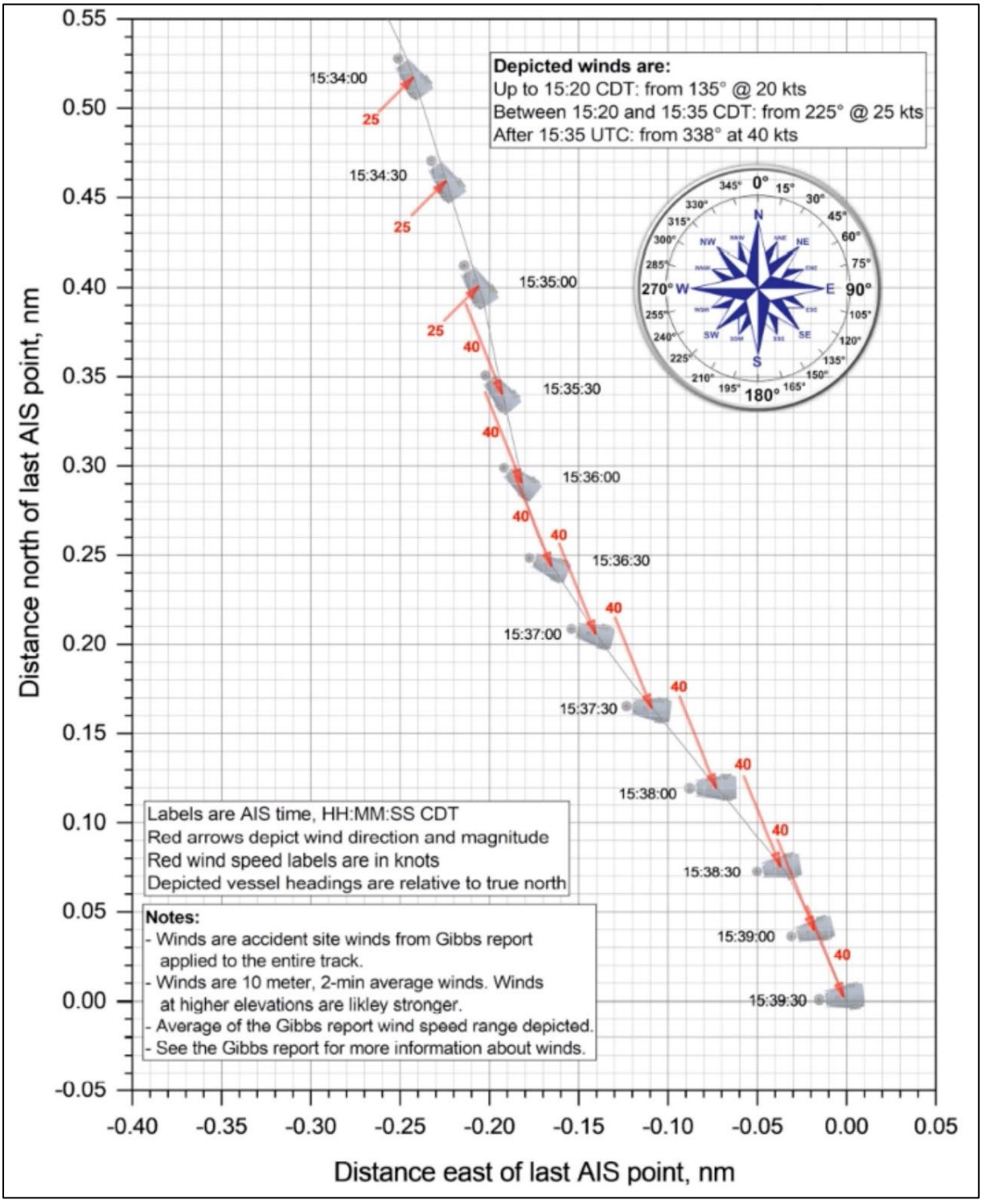

Figure 9: SEACOR POWER's final AIS transmission locations and headings with wind speeds from Exhibit 249 (provided by NTSB)

8.1.33. At approximately 1535, SEACOR POWER's First Mate disengaged the inboard engines and engaged the power take off (PTO) for the hydraulic system connected to the vessel's legs. His intention, as discussed with the Master, was to lower the legs to the seafloor in order to arrest the vessel's movement, a term called "soft tag". As the First Mate lowered

the legs, he turned the vessel to port using both the rudders and the engines. He applied forward thrust on the starboard outboard engine and astern thrust on the port outboard engine (twin-screwing). He attempted to rotate the bow in order to face into the wind and slow the SEACOR POWER's speed.

8.1.34. As SEACOR POWER turned to port, at approximately 1536, the vessel heeled 2.5 degrees to starboard. The First Mate received a call on the bridge phone from Cook 1 in the galley. Cook 1 reported water was coming in the watertight door. The First Mate told Cook 1 to dog the door tighter (further tighten the handles used to close the door), and then sent A/B 1 and A/B 2 to the galley to investigate. A/B 1 departed the wheelhouse and proceeded down through the internal stairwell. Before arriving in the galley, A/B 1 heard a loud noise on the 01 level (one level above the main deck) and exited the stairwell to investigate.

8.1.35. The First Mate observed SEACOR POWER heel 5 degrees to starboard, and he felt like the vessel was "going over." The Master took over at the controls of SEACOR POWER and attempted to steer the vessel back to starboard. The Master used the Gai-tronics public address system to instruct everyone to put on lifejackets. The First Mate activated the vessel's tilt alarm, which was located on the port side of the forward control console.

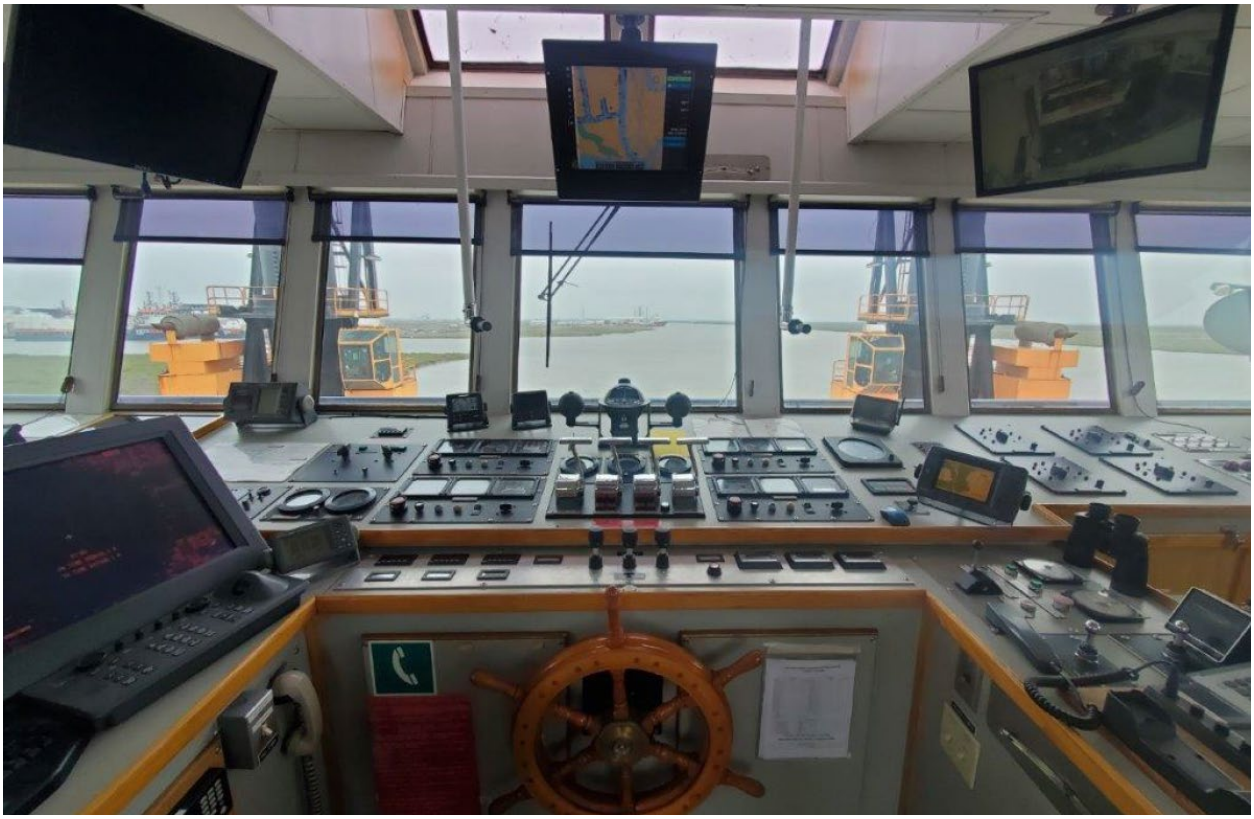

Figure 10: Wheelhouse Image of SEACOR POWER (from Exhibit 202)

8.1.36. At 1537, SEACOR POWER capsized to starboard.[20] The First Mate grabbed onto the port side pilothouse door as the vessel rolled. He saw the Master fall through the starboard pilothouse window. The First Mate attempted to signal distress. He pressed a button on the GMDSS console until he heard an audible beep.

8.1.37. Data from the Automatic Identification System (AIS) indicated that at 1537, Fishing Vessel CAPT JACK II was transiting within one nautical mile of SEACOR POWER and Offshore Supply Vessel CAT ISLAND was transiting within 0.5 miles of SEACOR POWER. Liftboat ROCKFISH was jacked up at South Timbalier Block 24, 2.5 miles east of SEACOR POWER. Offshore Supply Vessel CHRISTIAN CHOUEST was located 4.5 miles west of SEACOR POWER.[21]

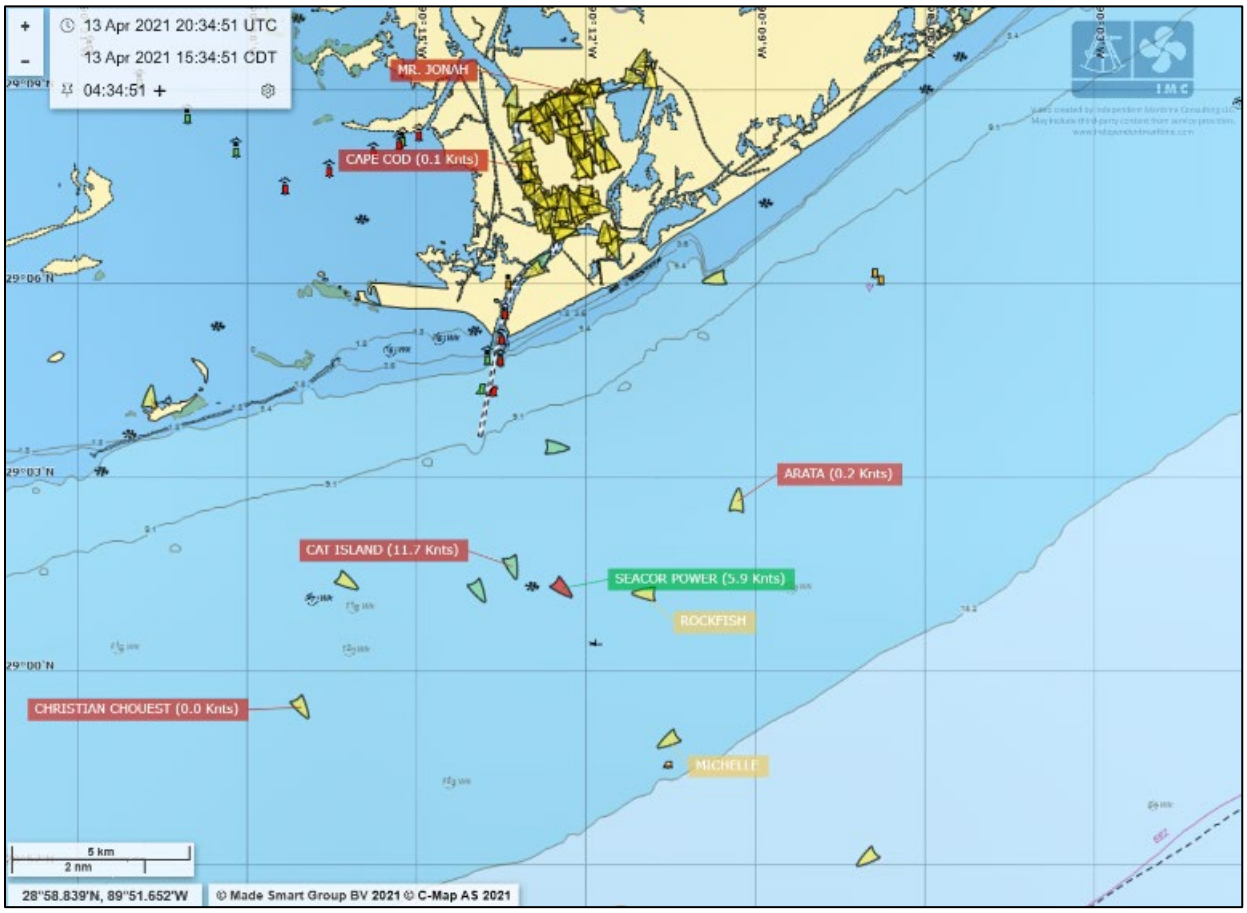

Figure 11: AIS Image of CAPT JACK II and CAT ISLAND passing near SEACOR POWER during capsizing

[20] Exhibit 45
[21] Exhibit 124

8.1.38. At 1537, the Liftboat VANESSA Master observed a wind speed of 103 mph. Approximately 3 minutes later he observed a 113 mph wind gust.[22] The vessel was located 4.5 nautical miles west-northwest of SEACOR POWER.[23]

Figure 12: Liftboat VANESSA Anemometer displaying 103mph winds at 1537

8.1.39. As SEACOR POWER capsized, furniture and equipment moved throughout the vessel. The Night Captain held onto his bunkbed frame as the vessel flipped and he saw his bags fly across the room. The Company Man's TV and shelves broke free in his 04-level port side stateroom. Cardinal Worker 4 observed a locker smash through the wall of his stateroom. Cardinal Worker 2 stated that lockers fell off the wall and the beds came apart.

8.1.40. In the wheelhouse, the First Mate donned an inflatable life vest that was not his and pushed open the portside wheelhouse door. He climbed through the door to the portside of the wheelhouse and then reached back through the door to grab the Search and Rescue Transponder (SART) from its wall mount near the door. The inflatable lifejacket did not

[22] Exhibit 252
[23] Exhibit 124

inflate. A Type 1 lifejacket floated up from inside the wheelhouse, and the First Mate grabbed it and put it on.

Figure 13: Image of SART aboard SEACOR POWER (Exhibit 154)

8.1.41. A/B 1 climbed up the ceiling in the 01-level passageway (hallway) to the portside exterior door, where A/B 3 pulled him out onto the port side of the deckhouse/superstructure. Neither A/B 1 nor A/B 3 were wearing a lifejacket.

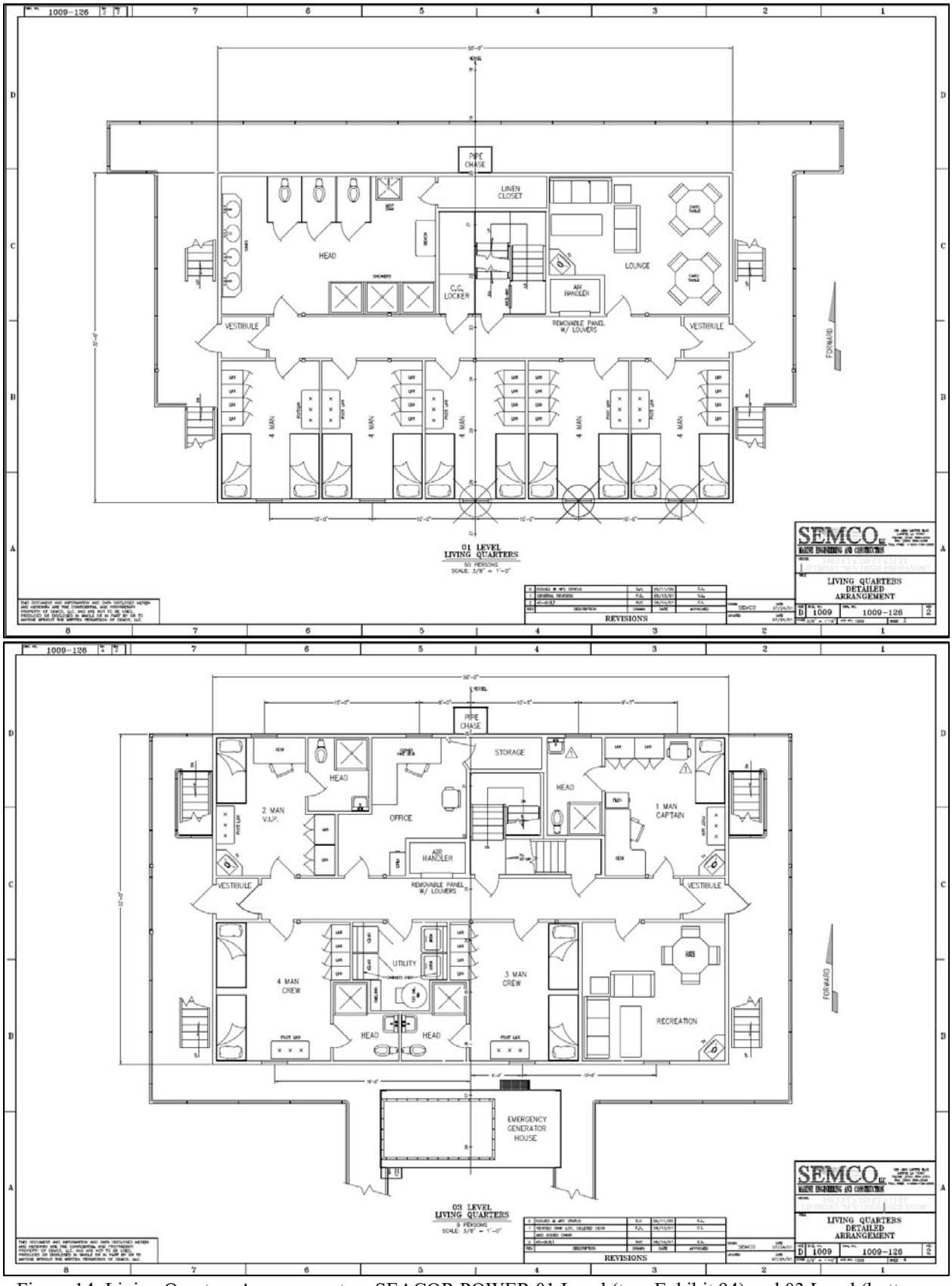

Figure 14: Living Quarters Arrangement on SEACOR POWER 01 Level (top, Exhibit 94) and 03 Level (bottom, Exhibit 96)

8.1.42. Cardinal Worker 2 tried to find a lifejacket in his stateroom, but he did not find one. He crawled out of his room, via a crawlspace in the ceiling, and into the hallway. He saw the hallway was flooded with seawater up to the centerline (about halfway) and opened the hallway door. Cardinal Worker 2 then climbed back into his stateroom once Cardinal Worker 4 broke the window and exited.

8.1.43. Cardinal Worker 4 used a fire extinguisher to break his stateroom window. He donned a work-type personal floatation device, turned on the light and crawled out of the SEACOR POWER. Once outside, Cardinal Worker 4 met up with Cardinal Workers 2 and 3, Cook 2, and two others he could not identify.

8.1.44. Cardinal Worker 2 was not wearing a lifejacket, and he observed that Cook 2, and the two unidentified individuals were not wearing personal floatation devices. Cardinal Worker 4 spotted a lifejacket that was floating in the hallway and stuck on a personal bag. One individual helped him to cut the lifejacket loose, but they accidentally cut the strap used to secure the lifejacket around the body. Cardinal Worker 4 gave the lifejacket to Cardinal Worker 2, who wore the lifejacket around his neck without securing it to his body.

8.1.45. For approximately 10 minutes, the Company Man and Night Captain attempted to break the window in the Company Man's stateroom using a fire extinguisher.

8.1.46. At 1539, SEACOR POWER's final AIS transmission reported the vessel in a position approximately 7 nautical miles south of Port Fourchon.[24]

8.1.47. At 1540, a satellite received a transmission from SEACOR POWER's Emergency Position Indicating Radio Beacon (EPIRB). This transmission did not include position information. The information was sent to the Coast Guard's District Eight Command Center in New Orleans at 1542. [25]

8.1.48. At 1541, another satellite detected SEACOR POWER's EPIRB and provided an "unconfirmed" position that was 0.3 nautical miles south-southeast of the capsized vessel. This information was sent to the District Eight Command Center at 1542.[26]

8.1.49. At 1543, a satellite detected the EPIRB and provided a "confirmed" position that was 3.5 nautical miles southeast of SEACOR POWER. This information was sent to the District Eight Command Center at 1544.[27]

8.1.50. The First Mate washed off SEACOR POWER three times as it sank and continued to heel over to starboard. He grabbed a lifering as he was washed away from the vessel for the final time. As he floated away, his legs got tangled in oil pollution boom (a long absorbent barrier used to capture oil spills). The First Mate freed himself using his

[24] Exhibit 45
[25] Exhibit 225
[26] Exhibit 225
[27] Exhibit 225

pocket knife. Between 1539 and 1830, the First Mate saw four vessels pass by, but none of the vessels' crews saw him. He caught the attention of the crew aboard the fifth vessel. Throughout his time in the water, the First Mate held the SART above the water. He held onto the SART's antenna (narrow end) and had the body (wide end) on top. He saw the SART's indicator/activation light illuminated.

8.1.51. At approximately 1548, the Company Man and Night Captain broke the 04-level port forward stateroom window. The Company Man gave the Night Captain a lifejacket, keeping his personal work vest for himself. The Company Man's lifejacket did not have a whistle or light attached. The Night Captain exited through the window, entering the water. The Night Captain grabbed onto a fire hose in the water and watched the Company Man enter the water from the broken window a few minutes later. The Night Captain yelled to A/B 1 who was on the deckhouse. Once in the water, the Company Man grabbed a line and observed four or five people on the side of the SEACOR POWER. Cardinal Worker 2 cut a section of fire hose free and threw one end to the Company Man but it didn't reach him. The Company Man lost his grip on the line he was holding and was swept away from SEACOR POWER. As the Company Man drifted away, he saw a vessel nearby and shouted to get their attention, but the vessel did not respond. The Night Captain held onto the firehose until his strength gave out and he drifted away from the vessel.

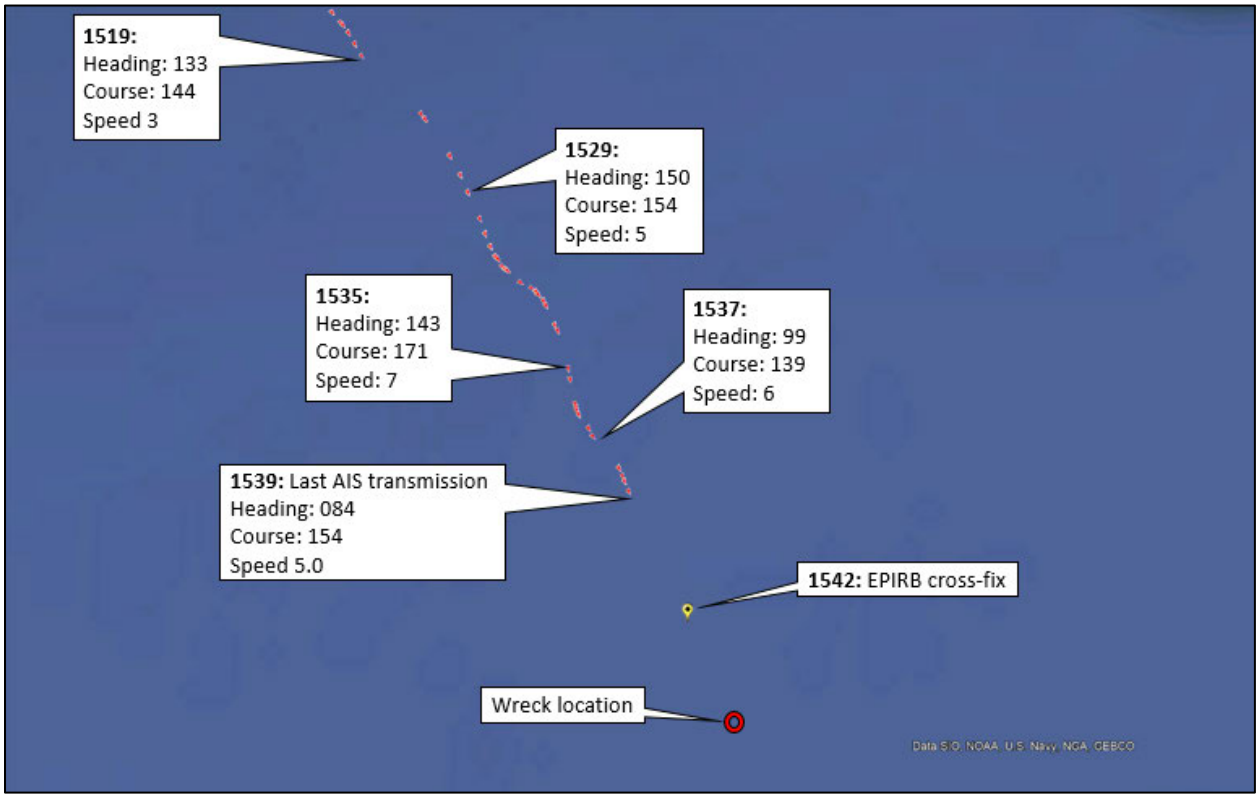

Figure 15: SEACOR POWER's final AIS position, EPIRB position, and actual wreck location

8.1.52. At 1600, the USCGC MORAY was moored at Coast Guard Station Grand Isle, LA. The vessel's crew recorded 75 knot winds coming from the north.[28] At the same time, Offshore Supply Vessel CHRISTIAN CHOUEST observed visibility less than ¼ mile and 75 knot wind gusts at their location, 4.5 miles west of SEACOR POWER. Between 1600 and 1621 the CHRISTIAN CHOUEST recorded a wind gust of 98 knots.[29] Around this time, the Master of the pre-commissioned Coast Guard Cutter GLENN HARRIS observed the winds jump from 10 to 15 knots, up to 80 knot winds, within a matter of one to two minutes. The winds remained at 80 knots for 15 to 20 minutes. The cutter was located 11 nautical miles northeast of SEACOR POWER.

8.1.53. During the hearing the Master of Liftboat ROCKFISH reported that his anemometer measured a wind gust of 112 mph on the date of the incident. The Master did not know what time this gust occurred, but provided a photo of the anemometer reading.[30] He stated that if he had known that type of weather was coming, he would have waited to move his vessel that day. He also stated that if he had moved the ROCKFISH 15 minutes later, then his vessel would have capsized as well.

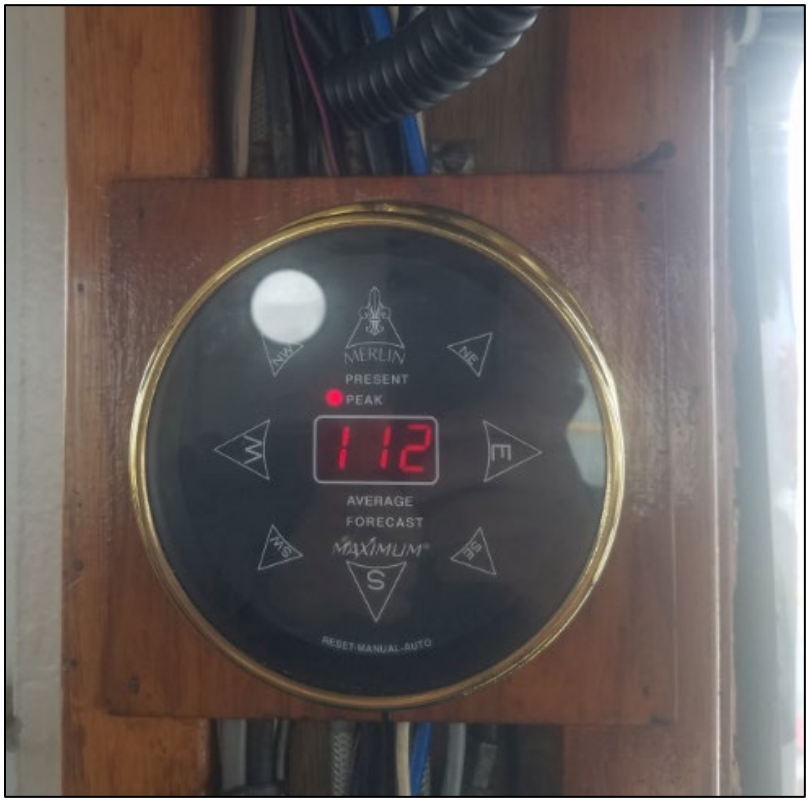

Figure 16: Liftboat ROCKFISH anemometer reading of 112 knots on April 13, 2021 (Exhibit 144)

[28] Exhibit 242
[29] Exhibit 7
[30] Exhibit 144

8.1.54. At approximately 1600, Coast Guard Air Station New Orleans and Coast Guard Aviation Training Center Mobile informed the District 8 Command Center that their aircraft could not take off because of weather. The District 8 Command Center continued to assess the availability of CG aircraft from New Orleans and Mobile over the next few hours and confirmed that aircraft could not take off due to weather.

8.1.55. Between 1605 and 1635, the Louisiana Offshore Oil Port (LOOP) recorded five minute maximum wind speeds between 72 and 94 knots. The five minute average wind speeds for this same period were between 54 and 76 knots. The facility was located approximately 18 miles offshore of Port Fourchon.[31]

8.1.56. The Coast Guard District 8 Command Center OU watchstander called the Seacor Dispatcher at 1605.[32] The D8 watchstander stated that SEACOR POWER's EPIRB activated and asked the Seacor Dispatcher if the vessel was underway or in distress. The Seacor Dispatcher informed the Command Center watchstander that SEACOR POWER was at the dock in Port Fourchon. The D8 watchstander asked the Seacor Dispatcher to have the vessel call him.

8.1.57. At 1616, the Seacor Dispatcher emailed SEACOR POWER stating that he "received a call at 1607 from the US Coast Guard regarding an EPIRB beacon alert coming from SEACOR POWER." The Dispatcher provided the phone number for the Coast Guard in his email and asked that the SEACOR POWER crew "verify the beacon ID number and inform them of the vessel's status." The Dispatcher copied the Seacor Operations Manager on the email.[33]

8.1.58. At 1628, visibility started improving and the crew of Liftboat ROCKFISH saw the overturned SEACOR POWER. The Master made a distress call on Very High Frequency (VHF) radio and stated that SEACOR POWER had capsized. The Coast Guard Sector New Orleans Command Center immediately entered the distress phase. The Sector New Orleans Command Duty Officer (CDO) stated that his watchstanders were already handling six or seven distress cases at that time, and the radio call regarding SEACOR POWER was the eighth distress case that occurred after 1500 that day.

[31] Exhibit 18
[32] Exhibit 229
[33] Exhibit 210

Figure 17: Image of capsized SEACOR POWER from April 14, 2021

8.1.59. The CHRISTIAN CHOUEST Master heard the VHF distress call, plotted the position of the capsized vessel, and then transited toward the location of the incident.[34] The STIM

[34] Exhibit 7

STAR IV Master heard the VHF distress call from the ROCKFISH Master. Due to the heavy weather conditions and the reduced visibility, the Master stated that he was just trying to maintain heading and position at that time.[35] The crews on the ARATA,[36] ELISE MARY,[37] MR LLOYD, [38] and GLENN HARRIS also heard the VHF distress call and the vessels headed toward SEACOR POWER.

8.1.60. The ROCKFISH Master called the Seacor Dispatcher to notify them that SEACOR POWER had capsized. The Seacor Dispatcher called and emailed Seacor's Qualified Individual to notify him of the call from ROCKFISH.[39]

8.1.61. At 1640, the Sector New Orleans Command Center issued an Urgent Marine Information Broadcast. They made the broadcast over VHF radio, and stated that the Coast Guard received a report of an overturned liftboat.

8.1.62. Between 1640 and 1655, the LOOP recorded five minute maximum wind speeds between 52 and 75 knots. The five minute average wind speeds for this same period were between 42 and 50 knots.[40]

8.1.63. At 1645, the Seacor Operations Manager called the District Eight Command Center.[41] He told the Command Center that he received a notification about the SEACOR POWER's EPIRB activation, and wanted to know if the Coast Guard had any information about the incident.

8.1.64. Carinal Worker 4 was swept off the hull, onto the crane railing, and then into the sea.

8.1.65. Between 1700 and 1855, the LOOP recorded five minute maximum wind speeds between 37 and 55 knots. The five minute average wind speeds for this same period were between 31 and 46 knots.[42]

8.1.66. At 1701, GLENN HARRIS arrived on scene with the capsized SEACOR POWER. The Master and crew observed 5 individuals located on the superstructure of SEACOR POWER.[43] The Bollinger Shipyard crew on GLENN HARRIS launched the small boat and approached SEACOR POWER, but the superstructure and the helo pad, which were just below the waterline, prevented the small boat from getting close to the five individuals. None of the individuals attempted to get into the water, so the small boat returned to GLENN HARRIS.

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[35] Exhibit 271
[36] Exhibit 239
[37] Exhibit 4
[38] Exhibit 237
[39] Exhibit 209
[40] Exhibit 18
[41] Exhibit 256
[42] Exhibit 18
[43] Exhibit 17

8.1.67. At approximately 1728,[44] the crewboat ARATA spotted Cardinal Worker 4 in the water, but the crew could not recover him. Offshore Supply Vessel ELISE MARY came to assist. At 1742, ELISE MARY rescued Cardinal Worker 4[45] in a position 1.7 nautical miles west-southwest from the SEACOR POWER's final position.[46]

8.1.68. At 1730, Coast Guard Station Grand Isle launched two 45' Medium Response Boats (Response Boat 45674 and Response Boat 45687). Ten minutes after launching, the Response Boats encountered wind and wave conditions outside of their operational parameters. One of the Response Boat coxswains called back to Station Grand Isle and requested a waiver to continue operating. The boats continued to proceed toward the SEACOR POWER site while they waited for an answer regarding the operational waiver. Approximately 15 minutes later, Coast Guard Sector New Orleans approved the operational waiver for Station Grand Isle's Response Boats to continue their Search and Rescue efforts in weather conditions that exceeded the boat's operational parameters.

8.1.69. Offshore Supply Vessel CAPE COD was transiting in the vicinity of the capsized vessel, and the crew saw a liferaft at 1745. They reported it to Sector New Orleans, checked the liferaft and did not find anyone inside, and then they joined the search.[47]

8.1.70. At 1748, Offshore Supply Vessel CHRISTIAN CHOUEST located the Night Captain approximately 4 nautical miles west-southwest from the capsized SEACOR POWER.[48] When CHRISTIAN CHOUEST announced the position over VHF, OSVs ARATA, ELISE MARY, and MR LLOYD moved toward the position to assist and search.[49] The Night Captain stated that he did not have the strength to swim towards the vessel or to climb onto the vessel. The CHRISTIAN CHOUEST maneuvered closer to the Night Captain. The vessel's crew attached a tether to their Chief Engineer and he jumped into the water to assist the exhausted Night Captain. At 1802, the CHRISTIAN CHOUEST recovered the Night Captain.[50]

[44] Exhibit 17
[45] Exhibit 4
[46] Exhibit 124
[47] Exhibit 2
[48] Exhibit 7
[49] Exhibit 237
[50] Exhibit 17

Figure 18: CHRISTIAN CHOUEST recovering the SEACOR POWER Night Captain from the water

8.1.71. At approximately 1808, Offshore Supply Vessel MR LLOYD located the Company Man approximately 5.6 nautical miles west-southwest of the capsized SEACOR POWER[51] and 300 feet from the location where CHRISTIAN CHOUEST rescued the Night Captain. The crew of MR LLOYD threw a lifering on a 90 foot lanyard to the Company Man. Then a crewmember entered the vessel's rescue platform and the crew lowered it. The crewmember was able to hold onto the Company Man and help him onto the platform and aboard the vessel. The Company Man had minor injuries and did not require first aid.[52]

[51] Exhibit 239
[52] Exhibit 237

8.1.72. At 1809, GLENN HARRIS' Forward Looking Infrared (FLIR) operator witnessed Cardinal Worker 2 fall from SEACOR POWER into the water.[53] The Master of GLENN HARRIS maneuvered the vessel near Cardinal Worker 2 as he drifted. Once they were close enough, the crew threw him a lifering. He grabbed on and the crew pulled him over to the Jacob's Ladder, where Cardinal Worker 2 climbed up and onto GLENN HARRIS.

8.1.73. At 1815, Coast Guard Cutter AMBERJACK got underway. They departed their location near Vermillion Bay (approximately 110 nautical miles west-northwest of the SEACOR POWER capsize site) in order to assist with the search efforts.[54]

8.1.74. At 1816, Offshore Supply Vessel CAPE COD sighted the First Mate approximately six nautical miles southwest of the capsized vessel. At 1830, the CAPE COD crew rescued the First Mate.[55]

8.1.75. Coast Guard Station Grand Isle's Response Boat 45674 arrived on scene with the capsized SEACOR POWER at 1839, and Response Boat 45687 arrived on scene at 1849.[56] The Coxswains observed 40 to 60 knots of wind, and 10 to 12 foot seas, with occasional 15 foot seas. They positioned their vessels downwind of SEACOR POWER.

8.1.76. At 1856, A/B 1 washed on and off SEACOR POWER twice, suffering a major abdominal laceration. Two minutes later, the crew of Response Boat 45687 rescued A/B 1.

8.1.77. At 1906, Response Boat 45687 notified GLENN HARRIS that they were going into Port Fourchon due to A/B 1's injuries.[57]

8.1.78. The Master of STIM STAR IV stated that the weather started to subside, and he slowly moved the STIM STAR IV towards SEACOR POWER.[58]

8.1.79. Bristow, a civilian helicopter company, decided to launch their medivac helicopter 739 from Galliano, LA (19 nautical miles north of Port Fourchon). This helicopter was equipped with winch capability and a rescue swimmer.

8.1.80. Bristow Helicopter 739 departed at 1934[59] and arrived on scene at 1953. Once on scene, Bristow Helicopter 739 lowered its rescue swimmer several times, but he could not reach the personnel remaining aboard SEACOR POWER. At approximately 2041, the helicopter crew lowered a bag to the SEACOR POWER personnel. The bag contained inflatable personal floatation devices and a radio.[60]

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[53] Exhibit 17
[54] Exhibit 240
[55] Exhibit 2
[56] Exhibit 23
[57] Exhibit 17
[58] Exhibit 271
[59] Exhibit 177
[60] Exhibit 17

8.1.81. At 1951, Coast Guard Fixed Wing "Casa" Aircraft 2317 arrived on scene.[61] They remained on scene until 0018.[62]

8.1.82. At 2059, Coast Guard Response Boat 45687 returned to the scene, after successfully delivering A/B 1 to emergency medical service personnel in Port Fourchon.[63]

8.1.83. Bristow Helicopter 739 departed the scene at 2101[64] and landed in Galliano to refuel at 2117.[65]

8.1.84. At 2119, GLENN HARRIS reported that one of three individuals remaining on the hull slid off into the water. Both Coast Guard Response Boats, Offshore Supply Vessel STIM STAR IV, and Coast Guard Aircraft 2317 began searching for the person.[66]

8.1.85. At approximately 2123, Response Boat 45674 located an unresponsive person in the water and attempted to recover them. A boat crewmember pulled the person closer and brought them to the recess (lower portion of the deck) of the Response Boat. While attempting to recover the person, the Response Boat Engineer was washed overboard and into the water. The other boat crewmember recovered the Engineer, but they could not locate the person that fell from SEACOR POWER. None of the other vessels on scene heard any reports from Response Boat 45674 regarding the person in the water or the crewmember overboard. At 2145, Response Boat 45674 departed the scene enroute Port Fourchon.[67]

8.1.86. Bristow Helicopter 739 departed Galliano airport at 2131[68] and arrived back on scene at 2203.[69] The Hoist Operator lowered the Rescue Swimmer again, but he could not reach the individuals on SEACOR POWER. At 2245, they departed the vessel to conduct a search nearby.

8.1.87. At 2153, the two remaining personnel on SEACOR POWER called GLENN HARRIS on the radio and stated that they were seeking shelter inside the port side engine room doorway.[70]

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[61] Exhibit 17
[62] Exhibit 23
[63] Exhibit 17
[64] Exhibit 17
[65] Exhibit 177
[66] Exhibit 17
[67] Exhibit 23
[68] Exhibit 177
[69] Exhibit 17
[70] Exhibit 17

8.1.88. At 2224, Coast Guard Helicopter 6506 took off from Air Station New Orleans.[71] The helicopter arrived on scene at 2258, and at 2312, the helicopter had 50-60 minutes of fuel remaining.[72]

8.1.89. At 2228, GLENN HARRIS' crew attempted to contact the personnel remaining on SEACOR POWER via radio. There was no response.[73]

8.1.90. At 2319, Coast Guard Helicopter 6005 took off from Aviation Training Center Mobile.[74]

8.1.91. At 2327, Response Boat 45687 departed the scene. The crew had reached the maximum number of hours they were allowed to operate.[75] The Coxswain of 45687 stated that the seas continued to build that evening. By the time he departed the scene, he observed 12 to 14 foot seas, with occasional 16 foot seas.

8.1.92. At 2333, Coast Guard Fixed Wing Airplane 2316 took off from Aviation Training Center Mobile.[76] They arrived on scene at 0022, and they remained on scene until 0458.[77]

8.1.93. At 2351, GLENN HARRIS departed the scene.[78]

8.1.94. At 2400, the crew of Offshore Supply Vessel CAPE COD recorded the weather at the location of the capsized SEACOR POWER. They observed rain, winds 40-50 knots, seas 10-12 feet, visibility 6-8 miles.[79]

8.1.95. On April 14 at approximately 0008, Coast Guard Helicopter 6506 departed the scene. At the same time, Coast Guard Helicopter 6005 arrived on scene, and remained on scene until 0454.[80]

8.1.96. At 0610, CGC BENJAMIN DAILEY departed their location in Port Isabel, TX (410 nautical miles southwest of Port Fourchon) to assist with the Search and Rescue efforts.[81]

8.1.97. At 0653, Bristow Helicopter 739 departed Galliano[82] and arrived back on scene with the SEACOR POWER at 0710.[83] The crew observed a liferaft next to the vessel.[84] They

[71] Exhibit 269
[72] Exhibit 17
[73] Exhibit 17
[74] Exhibit 268
[75] Exhibit 17
[76] Exhibit 268
[77] Exhibit 23
[78] Exhibit 17
[79] Exhibit 2
[80] Exhibit 23
[81] Exhibit 241
[82] Exhibit 177
[83] Exhibit 2
[84] Exhibit 179

lowered their rescue swimmer into the water at 0723,[85] and the rescue swimmer searched for survivors on the SEACOR POWER and in the liferaft. He did not find any survivors or any signs of life visually or as a response to banging on the hull. At 0745, the helicopter recovered the rescue swimmer,[86] conducted a search pattern, and returned to Galliano at 0833.[87]

Figure 19: Bristow Helicopters Rescue Swimmer on the hull of SEACOR POWER on April 14, 2021

8.1.98. At 0700, Coast Guard Helicopter 6005 departed Aviation Training Center Mobile.[88] They arrived on scene at 0825 and commenced a search pattern.[89]

8.1.99. At 0755, the CAPE COD, with the SEACOR POWER First Mate aboard, departed the scene in order to return to port.[90]

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[85] Exhibit 2
[86] Exhibit 2
[87] Exhibit 177
[88] Exhibit 268
[89] Exhibit 23
[90] Exhibit 2

8.1.100. At 0800, the CGC AMBERJACK arrived on scene.[91]

8.1.101. At 0807, Coast Guard Fixed Wing Airplane 2305 took off from Aviation Training Center Mobile to conduct a search for the SEACOR POWER case. They returned four hours later. At 1740, the aircraft took off again and conducted a seven and a half hour flight.[92]

8.1.102. At 0835, the crew of Coast Guard Helicopter 6005 located a body, without a lifejacket, about 1.4 nautical miles south-southwest of the capsized vessel. The helicopter pilots notified CGC AMBERJACK, and the vessel proceeded to the location. At 0930, CGC AMBERJACK's crew recovered the body of the Master. [93]

8.1.103. At 0955, Coast Guard Helicopter 6506 took off from Air Station New Orleans. The aircraft conducted two flights for the SEACOR POWER case. The aircraft had to wait in Galliano for more than three hours that day due to bad weather.[94]

8.1.104. On April 15 at 0803, CGC BENJAMIN DAILEY assumed on scene coordinator and commenced search patterns.[95]

8.1.105. At 1758, CG helicopter 6005 located a body along the shoreline.[96] At 1910, the CGC BENJAMIN DAILEY launched its small boat to recover the body. At 1938, the crew recovered the body of Cook 2.[97]

8.1.106. On April 16 at approximately 1445, Donjon-Smit divers detected the body of A/B 3 inside the capsized vessel. The body was located in and recovered from the portside engine room. The divers did not detect any air pockets inside the engine room.[98]

8.1.107. At approximately 1720, Donjon-Smit divers saw the body of Cook 1 surface unexpectedly behind the dive boat and recovered the body. At 1935, the dive boat transferred the bodies of A/B 3 and Cook 1 to shore.[99]

8.1.108. On April 18 at approximately 1930, Donjon-Smit divers discovered the body of the Assistant Chief Engineer in the starboard forward recreation area on level two. The divers recovered the body at 0115 on April 19 and took the body to shore.[100]

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[91] Exhibit 240
[92] Exhibit 268
[93] Exhibit 240
[94] Exhibit 269
[95] Exhibit 23
[96] Exhibit 23
[97] Exhibit 241
[98] Exhibit 254
[99] *Id.*
[100] *Id.*

8.1.109. On April 19 at 1935, Sector New Orleans suspended the search for the missing individuals. A combination of Coast Guard aircraft, cutters and small boats searched a total of 9,290 square nautical miles.

8.1.110. On April 20 at 1145, Donjon-Smit divers discovered the body of Fugro Worker 2 in the portside engine room. The divers recovered the body at 1648 and took the body to shore.[101]

8.1.111. The Chief Engineer, A/B 2, Galley Hand, Cardinal Worker 1, Cardinal Worker 3, Fugro Worker 1, and Major Equipment Worker were not found and presumed dead as a result of the capsize.

8.2 Company Organization and Operations

8.2.1. On April 13, 2021, Falcon Global Offshore II LLC (Falcon Global) owned the SEACOR POWER, and Seacor Marine LLC (Seacor) operated the SEACOR POWER. In February 2022, the Seacor website noted that the company operated a fleet of 93 vessels, including 12 liftboats, 34 Platform Supply Vessels (PSV), 39 Fast Support Vessels (FSV), 6 Anchor Handling Towing Supply (AHTS) vessels and 2 specialty vessels. Both Seacor and Falcon Global were subsidiaries of Seacor Marine Holdings Inc. (SMHI), a publicly traded company.[102]

8.2.2. On the Human Resources side of the company, the Executive Vice President (EVP) worked for the Chief Executive Officer (CEO). The EVP also served as the Chief Financial Officer (CFO). The EVP supervised the Director of Human Resources.[103]

8.2.3. On the Operations/Technical Services side of the company, the General Manager worked for the CEO. The General Manager supervised four Technical Superintendents, two Operations Managers, a Technical Administrator, a Document Controller, and three Dispatchers.[104] The organization of the Operations/Technical Services side of the company is shown in the figure below.

[101] *Id.*
[102] Seacor Marine, www.seacormarine.com (last visited May 11, 2021)
[103] Exhibit 78
[104] *Id.*

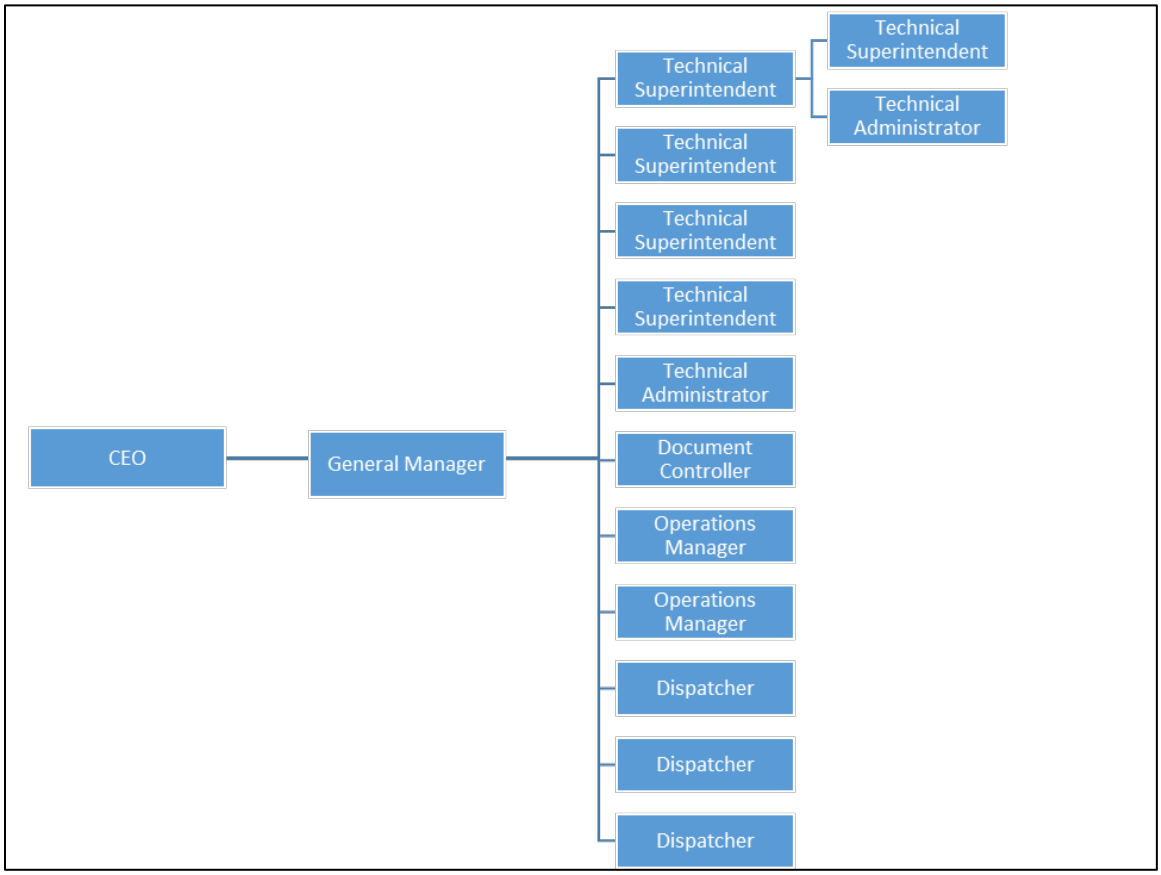


Figure 20: Seacor Operations/Technical Services Organization Chart

8.2.4. Seacor's General Manager for the Gulf of Mexico started working with offshore vessels in 1993 and he served in various managerial roles for McDermott Fabrication and TRICO Marine. He began working for Superior Energy in 2007, and then Seacor acquired Superior Energy's vessels in 2012. During the hearing the General Manager stated that he moved into his position in the summer of 2019. The General Manager was responsible for ensuring vessels had adequate supplies, making sure vessels remained in compliance, and overseeing the day-to-day operations of the vessels in the Gulf of Mexico.

8.2.5. The Technical Superintendent who oversaw SEACOR POWER began working for a liftboat company in 1977. He stated that the company eventually became Seacor. The Technical Superintendent spent 15 years operating liftboats in various positions, including master, and moved into his position as Technical Superintendent about 6 to 7 years before the hearing. The Technical Superintendent stated that he was responsible for monitoring routine maintenance and repairs for SEACOR POWER (and other liftboats), which included rectifying defects and procuring parts. His responsibilities also included coordination of statutory and classification society surveys, inspections, and certificates. The Technical Superintendent stated that he reported to the General Manager, although

the Safety Management System (SMS) stated that Technical Superintendents reported to the Technical Manager.[105]

8.2.6. The Technical Superintendent stated that he used a program called Helm Connect to order parts. The Off-Boat Chief Engineer stated that Seacor implemented Helm Connect, a new maintenance software, at the beginning of 2021. According to the Helm Connect website, the system was designed to help quickly and easily create task management for the crew; manage recurring maintenance routines and track completion; track inventory across assets, manage part usage, simplify request tracking and manage requests for parts. The purpose of the system was to reduce downtime, improve utilization, optimize spending, and manage overall operations.[106]

8.2.7. The Operations Manager who oversaw SEACOR POWER began working on liftboats as an Ordinary Seaman (OS) during the summers while he attended high school and college. At that time he held a Merchant Mariner Credential (MMC) as an OS, but he no longer holds that credential. He began working for a company called MONTCO Offshore in 2012, and Seacor later acquired MONTCO. In May of 2020, he took over as the Operations Manager for liftboats. The Operations Manager stated that his responsibilities included following up on surveys and repair certificates; assisting the DPA with safety and investigations; conducting officer appraisals (including the Masters and Chief Engineers); reviewing defects, incidents, and customer complaints; providing guidance to the Masters regarding navigation, bunkering and communications; approving requisitions and provisions; and ensuring that weekly checks were conducted on inactive vessels.

8.2.8. The Operations Manager contacted the Master of each active liftboat on a daily basis to check in and see how everything was going. These discussions were mostly completed via cell phone.

8.2.9. The Operations Manager reported to the General Manager. The Seacor SMS identified the title of the Operations Manager's position as the Technical and Operations Manager. In addition to the duties that the Operations Manager described, the SMS also stated that this position was responsible for the safety and welfare of both sea staff and shore staff, this position ensured that adequate resources and shore-based support were applied, and this position provided the primary management link between the shore and vessel management regarding issues related to operations, repair, safety and pollution prevention.[107]

8.2.10. The SEACOR POWER Master reported to the Operations Manager. The Quality, Health, Safety and Environmental (QHSE) Manager stated that the masters of Seacor vessels had the ultimate authority to oversee all operations on board. This was similar to the information in the SMS, which stated that the master had overriding authority and responsibility to make decisions with respect to safety and pollution prevention, and to

[105] Exhibit 78
[106] Helm, www.helmoperations.com (last visited May 11, 2022)
[107] Exhibit 78

request the company's assistance, as may be deemed necessary. The master's overriding authority applied to both normal and extreme circumstances. The SMS also outlined the master's specific responsibilities, which included a list of 57 items. The list stated that the master was responsible for safe navigation and operation of the vessel, ensuring seaworthiness of the vessel, adhering to good seamanship practices, compliance with stability and cargo loading, and completion of vessel familiarization, training and drills.[108]

8.2.11. The Dispatcher who was on duty at the time of the incident began working for Seacor in 2007. The Dispatcher described his duties as monitoring email, receiving and transferring phone calls, sending a daily vessel report, assisting with crew changes, general maintenance around the facilities, and helping in the warehouse when needed. Newly hired dispatchers were trained "on the job," and all dispatchers receive quarterly SMS training.[109] The Dispatcher's duties were not described in the company's SMS.[110]

8.2.12. The QHSE Manager began working for Seacor in 2006. Prior to this, he worked in oil field industry support. The QHSE Manager was also the Designated Person Ashore (DPA) and the Company Security Officer (CSO). He took his position as QSHE Manager and CSO in 2016, and he started as the DPA in 2020. The QHSE Manager worked for the CEO, and supervised a QHSE Superintendent, who also served as the Alternate DPA and Alternate CSO. The QHSE Manager was responsible for establishing policy, procedures, and practices to protect people, property, and the environment. He administered the SMS and ensured it was established and implemented. The QHSE Manager's responsibilities also included those outlined for a Quality Manager in the International Standardization Organization 90001: Quality Assurance. The CSO was responsible for physical security and security plans. The DPA responsibilities were defined in the International Safety Management (ISM) Code, and included acting as a link between the vessel and the highest level of management ashore, especially for safety-related issues.

8.2.13. The QHSE Superintendent began working for MONTCO in 2001, and that company was later acquired by Seacor. From 2001 to 2019, the QHSE Superintendent worked as both an Ordinary and Able-bodied Seaman. In 2019, he started in the QHSE Superintendent position. He reported to the QHSE Manager. The QHSE Superintendent was responsible for ISM and International Ship and Port Security (ISPS) audits, company compliance, and investigation and identification of root causes of incidents. The QHSE Superintendent was also the alternate DPA and alternate CSO.

8.2.14. The QHSE Manager and Superintendent managed Seacor's Safety Management System (SMS), and they updated the system on January 1, 2020 (revision 17). SEACOR POWER's crew was using the updated SMS during the final voyage. The SMS was a

[108] Exhibit 78
[109] Exhibit 236
[110] Exhibit 78

system that covered all aspects of fleet operations, including cargo securing, loading, stability, weather, stop work, and shore side reporting.

8.2.15. ABS issued a Document of Compliance (DOC) to Seacor on March 25, 2021, after they finished a SMS audit. The audit focused on Seacor's vessel management in North America and the Caribbean, and involved personnel interviews and reviews of records, Fleet Operations Manual revisions, organizational charts, and established policies. ABS did not identify any SMS non-conformities or observations. A company with a DOC was required to undergo an audit every five years.

8.2.16. Vessel captains provided annual reviews of the SMS. Each year, Seacor sent SMS surveys to their vessel crews in order to obtain feedback regarding ways to improve the SMS. On January 23, 2020, the Master, First Mate, A/B 1, Chief Engineer, and A/B 3 completed an SMS survey. They identified an issue with the bridge order book and the crane specific log book. They provided positive feedback on the maintenance and repair form.[111]

8.2.17. Seacor sent a customer satisfaction survey to all of the companies that contracted their vessels. Talos Energy completed a customer satisfaction survey for SEACOR POWER and the Master on March 15, 2021. The survey noted that everything about the vessel and crew exceeded expectations.[112]

8.2.18. Seacor and Talos Energy used two types of charter agreements for contracting vessels: long-form and short-form. The companies' representatives signed a long-form time charter agreement on August 9, 2013. This agreement laid out the provisions of the time charter and included a statement that the owner shall "man, victual, navigate, operate, supply, maintain and repair all Vessels and furnish supervision, labor, equipment, machinery, tools, materials and supplies necessary for performing any Charter Services." It further stated that the vessel remained under the owner's sole control, and the owner provided the master, officers, and crew for the vessel, as well as food and bunking for the owner and charterer's personnel. The charterer (Talos Energy) was responsible for fuel, loading and unloading cargoes, customs fees and duties, and "dunnage, shifting boards, uprights and shoring equipment for securing deck cargo." The long-form charter agreement contained a "force majeure" clause that relieved the parties of their obligations in the case of acts of God, including hurricanes, storms (named or unnamed), floods, etc.[113] The companies then completed short-form charter agreements for specifics jobs, and these agreements included the daily rates and costs of service. Representatives from Seacor and Talos Energy signed a short-form charter agreement on February 20, 2021, which remained in effect throughout the day of the incident voyage.[114] Seacor Marine was listed as the owner of the vessel in both the long-form and short-form agreements.

[111] Exhibit 134
[112] Exhibit 130
[113] Exhibit 123
[114] Exhibit 129

8.2.19. The Company Man had 25 to 30 years of offshore work experience. Early in his career he worked as a roughneck (deck worker on a drilling rig) and worked with Schlumberger. Then he worked for Chalmers, Collins, and Atwell Consulting, Inc. for 15 years. He stated that approximately one third to one half of his work involved liftboats. At the time of the accident, the Company Man was an employee of Blue Water Consulting, LLC, working under contract for Chalmers, Collins, and Atwell Consulting. Talos contracted Chalmers, Collins, and Atwell Consulting to provide a Company Man for the work at Main Pass 138. The Company Man's responsibility was to serve as the representative of the oil company, ensuring all needed equipment was loaded on the vessel and directing on-location work to ensure that procedures were followed. He stated that his authority started when the vessel arrived on-location. He reported to Talos' project engineer. The Company Man stated that he had previously worked with the Master, while aboard SEACOR POWER, approximately 5 years before the accident.

8.2.20. According to 46 CFR 125.160, an offshore worker is defined as an individual carried aboard an OSV and employed in a phase of exploration, exploitation, or production of offshore mineral or energy resources served by the vessel. The term offshore worker does not include the master or a member of the crew engaged in the business of the vessel, who has contributed no consideration for carriage aboard and is paid for services aboard. On April 13, 2021, there were seven offshore workers aboard SEACOR POWER in addition to the Company Man described above. These offshore workers were employed by Cardinal, Fugro, and Major Equipment, and they were contracted by Talos.

8.2.21. Seacor Marine had a Vessel Response Plan (VRP) for each of their vessels. A VRP is used to establish procedures for the response to an oil spill or threat of a spill from Seacor vessels, identifying the resources necessary for responding to and mitigating spills. Seacor contracted with Environmental Safety and Health Consulting Services and National Response Corporation as the Oil Spill Response Organizations. Seacor contracted Donjon-Smit as the Salvage and Marine Firefighting (SMFF) provider. As the SMFF, Donjon-Smit was contracted to perform marine firefighting and marine salvage services listed in 33 CFR 155.4030(a) through (h) including assessment, hull and bottom survey, emergency towing, salvage plan development, external emergency transfers, emergency lightering, temporary repairs, diving to support salvage operations, subsurface product removal, and heavy lift. The SMFF contract did not cover diving for Search and Rescue purposes.[115]

8.3 Vessel History and Condition

8.3.1. The SEMCO shipyard laid the keel for DIXIE ENDEAVOR in Lafitte, Louisiana on Nov. 1, 2000. (The vessel was later renamed SEACOR POWER in 2012). The shipyard requested to use ABS to review the vessel's construction plans and stability calculations,

[115] Exhibit 255

rather than sending those items to the Coast Guard Marine Safety Center for approval. On August 17, 2001, ABS received approval to review the vessel's construction plans under the provisions of Coast Guard Navigation and Vessel Inspection Circular (NVIC) 10-82. That same day, ABS received approval to review the vessel's stability calculations under the provisions of Coast Guard NVIC 3-97. [116]

8.3.2. ABS reviewed and approved construction plans for the vessel in accordance with NVIC 10-82. The Coast Guard Marine Safety Center reviewed and approved only the General Arrangement plan. The Marine Safety Center did not conduct an oversight review of any construction plans.

8.3.3. On March 15, 2002, SEMCO's naval architect submitted revision 0 of the DIXIE ENDEAVOR "Intact and Damaged Stability Analysis" to ABS. Revision 0 of this analysis used leg lengths of 250 feet.

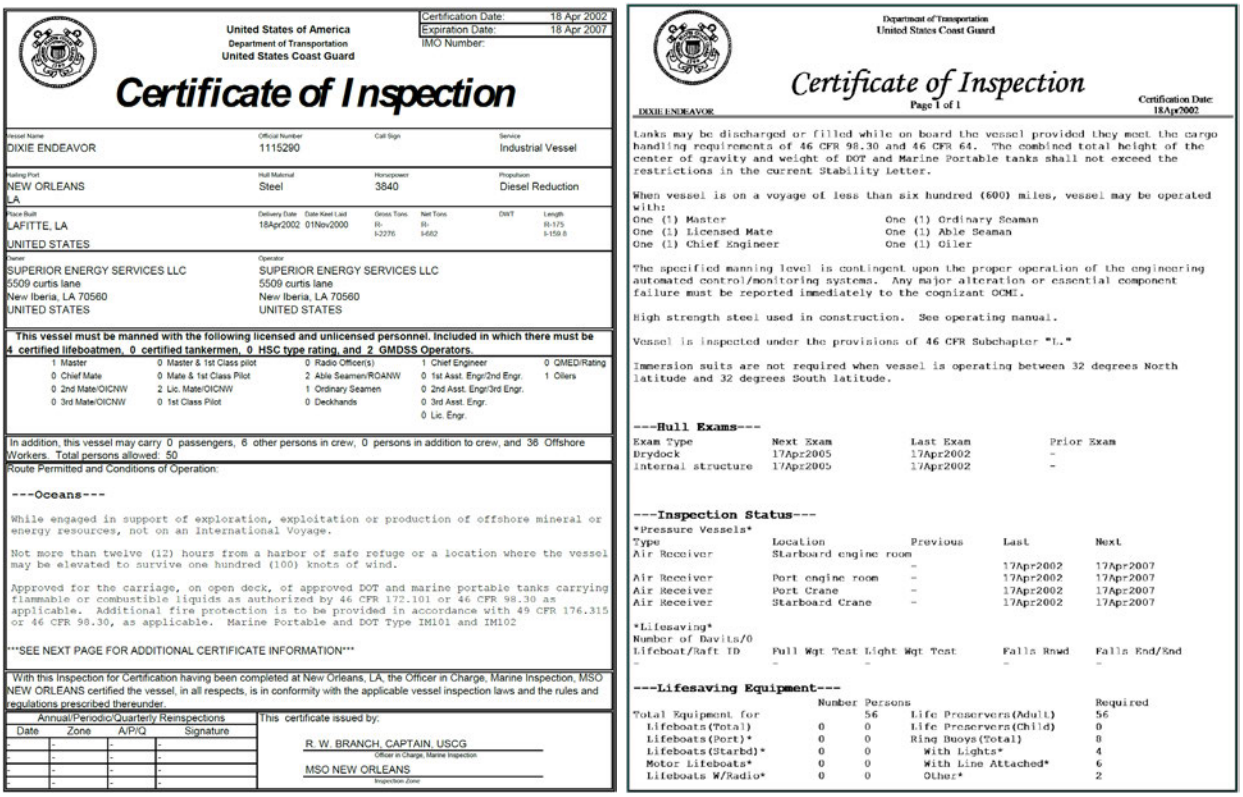
8.3.4. On March 25, 2002, SEMCO conducted a stability test on DIXIE ENDEAVOR at McDermott Shipyards in Amelia, LA. ABS had a representative witness the stability test on their behalf. SEMCO sent the results of the stability test to ABS on March 27, 2002, and ABS approved them on April 10, 2002.

8.3.5. Also on April 10, 2002, ABS Houston stamped SEMCO's revision 0 analysis "Not Reviewed, Acknowledged for Record Only" and ABS issued a letter to SEMCO referencing their March 15, 2002, Stability Analysis, but not explicitly approving or disapproving it. In this same letter, ABS stated: "having completed out analysis, we have found the stability of the unit to be in compliance with the" ABS Rules for Building and Classing Mobile Offshore Drilling Units (2001) and U.S. Coast Guard regulations in 46 CFR Subchapter S. The ABS letter provided tables of drafts and maximum vertical centers of gravity for leg lengths of 250 feet.

8.3.6. On April 18, 2002, SEMCO delivered DIXIE ENDEAVOR. On the same day, the Coast Guard inspected the vessel and issued the initial Certificate of Inspection (COI). The COI was valid for five years and allowed the vessel to operate on an oceans route "not more than 12 hours from a harbor of safe refuge or a location where the vessel may be elevated to survive 100 knot of wind." The COI required the following manning: 1 Master, 2 Mates, 2 ABs, 1 Chief Engineer, 1 OS, and 1 Oiler. A total of 50 persons were allowed aboard, including up to 36 offshore workers.

8.3.7. On July 1, 2002, SEMCO's naval architect submitted revision 1 of the DIXIE ENDEAVOR "Intact and Damaged Stability Analysis," dated June 27, 2002, to ABS. SEMCO's revision 1 analysis used 265 feet for the length of the legs.

[116] Exhibit 244



United States of America
Department of Transportation
United States Coast Guard

Certification Date: 18 Apr 2002
Expiration Date: 18 Apr 2007
IMO Number:

Certificate of Inspection

Vessel Name	Official Number	Call Sign	Service
DIXIE ENDEAVOR	1115290		Industrial Vessel

Hailing Port	Hull Material	Horsepower	Propulsion
NEW ORLEANS LA	Steel	3840	Diesel Reduction

Place Built	Delivery Date	Date Keel Laid	Gross Tons	Net Tons	DWT	Length
LAFITTE, LA UNITED STATES	18Apr2002	01Nov2000	R- I-2276	R- I-682		R-175 I-159.8

Owner	Operator
SUPERIOR ENERGY SERVICES LLC 5509 curtis lane New Iberia, LA 70560 UNITED STATES	SUPERIOR ENERGY SERVICES LLC 5509 curtis lane New Iberia, LA 70560 UNITED STATES

This vessel must be manned with the following licensed and unlicensed personnel. Included in which there must be 4 certified lifeboatmen, 0 certified tankermen, 0 HSC type rating, and 2 GMDSS Operators.

1 Master	0 Master & 1st Class pilot	0 Radio Officer(s)	1 Chief Engineer	0 QMED/Rating
0 Chief Mate	0 Mate & 1st Class Pilot	2 Able Seamen/ROANW	0 1st Asst. Engr/2nd Engr.	1 Oilers
0 2nd Mate/OICNW	2 Lic. Mate/OICNW	1 Ordinary Seamen	0 2nd Asst. Engr/3rd Engr.	
0 3rd Mate/OICNW	0 1st Class Pilot	0 Deckhands	0 3rd Asst. Engr.	
			0 Lic. Engr.	

In addition, this vessel may carry 0 passengers, 6 other persons in crew, 0 persons in addition to crew, and 36 Offshore Workers. Total persons allowed: 50

Route Permitted and Conditions of Operation:

---Oceans---

While engaged in support of exploration, exploitation or production of offshore mineral or energy resources, not on an International Voyage.

Not more than twelve (12) hours from a harbor of safe refuge or a location where the vessel may be elevated to survive one hundred (100) knots of wind.

Approved for the carriage, on open deck, of approved DOT and marine portable tanks carrying flammable or combustible liquids as authorized by 46 CFR 172.101 or 46 CFR 98.30 as applicable. Additional fire protection is to be provided in accordance with 49 CFR 176.315 or 46 CFR 98.30, as applicable. Marine Portable and DOT Type IM101 and IM102

SEE NEXT PAGE FOR ADDITIONAL CERTIFICATE INFORMATION

With this Inspection for Certification having been completed at New Orleans, LA, the Officer in Charge, Marine Inspection, MSO NEW ORLEANS certified the vessel, in all respects, is in conformity with the applicable vessel inspection laws and the rules and regulations prescribed thereunder.

Annual/Periodic/Quarterly Reinspections

Date	Zone	A/P/Q	Signature
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-

This certificate issued by:

R. W. BRANCH, CAPTAIN, USCG
Officer in Charge, Marine Inspection

MSO NEW ORLEANS
Inspection Zone

Department of Transportation
United States Coast Guard

Certificate of Inspection

DIXIE ENDEAVOR — Page 1 of 1 — Certification Date: 18Apr2002

Tanks may be discharged or filled while on board the vessel provided they meet the cargo handling requirements of 46 CFR 98.30 and 46 CFR 64. The combined total height of the center of gravity and weight of DOT and Marine Portable tanks shall not exceed the restrictions in the current Stability Letter.

When vessel is on a voyage of less than six hundred (600) miles, vessel may be operated with:

One (1) Master	One (1) Ordinary Seaman
One (1) Licensed Mate	One (1) Able Seaman
One (1) Chief Engineer	One (1) Oiler

The specified manning level is contingent upon the proper operation of the engineering automated control/monitoring systems. Any major alteration or essential component failure must be reported immediately to the cognizant OCMI.

High strength steel used in construction. See operating manual.

Vessel is inspected under the provisions of 46 CFR Subchapter "L."

Immersion suits are not required when vessel is operating between 32 degrees North latitude and 32 degrees South latitude.

---Hull Exams---

Exam Type	Next Exam	Last Exam	Prior Exam
Drydock	17Apr2005	17Apr2002	-
Internal structure	17Apr2005	17Apr2002	-

---Inspection Status---

Pressure Vessels

Type	Location	Previous	Last	Next
Air Receiver	Starboard engine room	-	17Apr2002	17Apr2007
Air Receiver	Port engine room	-	17Apr2002	17Apr2007
Air Receiver	Port Crane	-	17Apr2002	17Apr2007
Air Receiver	Starboard Crane	-	17Apr2002	17Apr2007

Lifesaving

Number of Davits/0				
Lifeboat/Raft ID	Full Wgt Test	Light Wgt Test	Falls Rnwd	Falls End/End
-	-	-	-	-

---Lifesaving Equipment---

	Number	Persons		Required
Total Equipment for		56	Life Preservers(Adult)	56
Lifeboats(Total)	0	0	Life Preservers(Child)	0
Lifeboats(Port)*	0	0	Ring Buoys(Total)	8
Lifeboats(Starbd)*	0	0	With Lights*	4
Motor Lifeboats*	0	0	With Line Attached*	6
Lifeboats W/Radio*	0	0	Other*	2

Figure 21: SEACOR POWER's first COI dated April 18, 2002

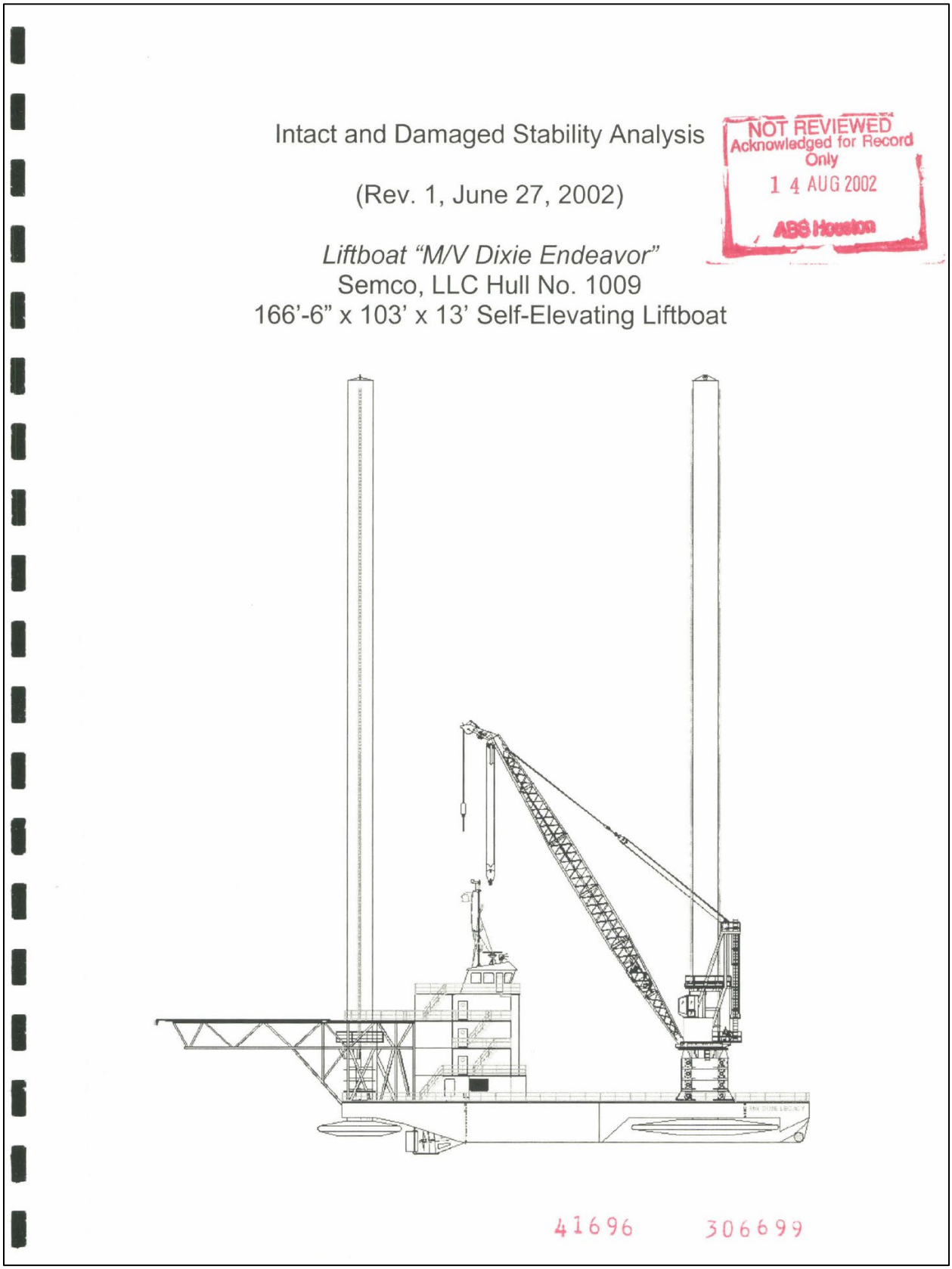


Figure 22: Cover page of SEMCO's Intact and Damaged Stability Analysis from June 27, 2002

8.3.8. On August 14, 2002, ABS Houston stamped SEMCO's analysis "Not Reviewed, Acknowledged for Record Only" and issued a letter to SEMCO referencing their June 27, 2002, Stability Analysis but not explicitly approving or disapproving it. The August 14, 2002 ABS letter to SEMCO provided tables of drafts and maximum vertical centers of gravity for leg lengths of both 250 and 265 feet. The 265-foot leg drafts and vertical centers of gravity remained unchanged in SEACOR POWER's Marine Operations Manual, Revision 4, dated October 21, 2014, which was in effect at the time of the accident.

8.3.9. On June 7, 2005, Alario and Associates, LLC sent a request to Coast Guard Headquarters for DIXIE ENDEAVOR to carry up to 66 offshore workers, in addition to the vessel's crew. Coast Guard Headquarters "conceptually" approved the request for 66 offshore workers, as noted in a letter dated November 17, 2005. For this approval, Coast Guard Headquarters required: no carriage of passengers, a Coast Guard approved preloading and jacking procedure be included in the Marine Operations Manual, a bottom survey prior to loading more than 36 offshore workers, ability for the vessel to reach safe refuge prior to the onset of conditions exceeding the stability restrictions, an Emergency Evacuation Plan, installation of GMDSS on the vessel, and approval of any portable accommodation modules.

8.3.10. ABS issued International Convention for Safety of Life At Sea (SOLAS) certificates to DIXIE ENDEAVOR in June 2010. These certificates indicated that the vessel met all of the requirements to travel on an international voyage. After ABS issued the SOLAS certificates, the Coast Guard amended the COI to document the issuance of SOLAS Certificates.

8.3.11. On August 23, 2010, ABS approved DIXIE ENDEAVOR's Cargo Securing Manual.

8.3.12. In May 2012, Seacor purchased the DIXIE ENDEAVOR and changed the name to SEACOR POWER. The Coast Guard issued a new COI on May 9, 2012. The new COI reflected the new owner, operator and name.

8.3.13. After purchasing the vessel, Seacor extended SEACOR POWER's legs from 250 feet to 265 feet. On June 29, 2012, SEMCO performed a second stability test on SEACOR POWER after the legs were extended from 250 feet to 265 feet. The test was conducted in Lafitte, LA. SEMCO provided ABS with an inclining report on September 7, 2012. ABS approved the new lightship characteristics in a letter dated October 26, 2012. SEACOR POWER's Marine Operations Manual, Revision 2, dated November 29, 2012, incorporated the new lightship characteristics and ABS stamped it "Reviewed" on March 13, 2013.

8.3.14. In 2014, the Coast Guard changed SEACOR POWER's COI to read, "Vessel is to proceed to a harbor of safe refuge or elevate at a location where it can survive one

hundred (100) knots of wind when the twelve (12) hour weather forecast predicts sustained winds in excess of sixty (60) knots". [117]

8.3.15. ABS issued a new stability letter to SEACOR POWER on October 31, 2014, documenting the 2012 stability test and revision of the Operations Manual for the vessel. ABS also stamped the new Marine Operations Manual (MOM), Revision 4, dated October 21, 2014. ABS stamped the cover with "reviewed," and stamped every page of the MOM with a reference to their letter, but according to hearing testimony, they only reviewed stability related items in the Manual. ABS sent the MOM to the Coast Guard for review of the non-stability related items, but there was no evidence of this review.

FOUNDED 1862 ABS

31 October 2014

STABILITY LETTER

Offshore Installation Manager, **"SEACOR POWER"** ON1115290
ABS ID 0241696
SEMCO Hull 1009
Self-Elevating Unit (Restricted Service)

You are responsible for maintaining this unit in a satisfactory stability condition at all times. For this purpose, you shall calculate the unit's stability for each condition not covered in detail in the operating manual mentioned below, and for intermediate conditions in each voyage as necessary to assure the maintenance of satisfactory stability.

An inclining experiment, witnessed by the American Bureau of Shipping, was conducted on the SEACOR POWER. O.N. 1115290, in SEMCO south yard, Lafitte, LA on 29 June 2012. On the basis of this experiment and detailed weight and moment calculations to account for subsequent modifications, stability calculations have been performed. Results indicate that the stability information contained in the booklet specified below, which has been provided to the vessel, is applicable to the SEACOR POWER as presently outfitted and equipped:

Marine Operations Manual, SEACOR POWER, Rev. 4, dated 21 October 2014.

The data presented in the manual demonstrates compliance with the applicable stability requirements of 46 CFR Part 174 Subpart H, in addition to the requirements of 46 CFR 134.170. Such data provides you with sufficient information for the following purposes:

1) To determine the vertical center of gravity location and freeboard for any condition of loading or operation.

2) To obtain by rapid and simple process accurate guidance as to the stability for any condition of loading or operation.

This stability letter shall be posted under glass or other suitable transparent material in the control room of the subject unit. It supersedes any stability information previously issued to the unit.

Figure 23: Stability Letter for SEACOR POWER dated October 21, 2014 (Exhibit 58)

[117] Exhibit 260

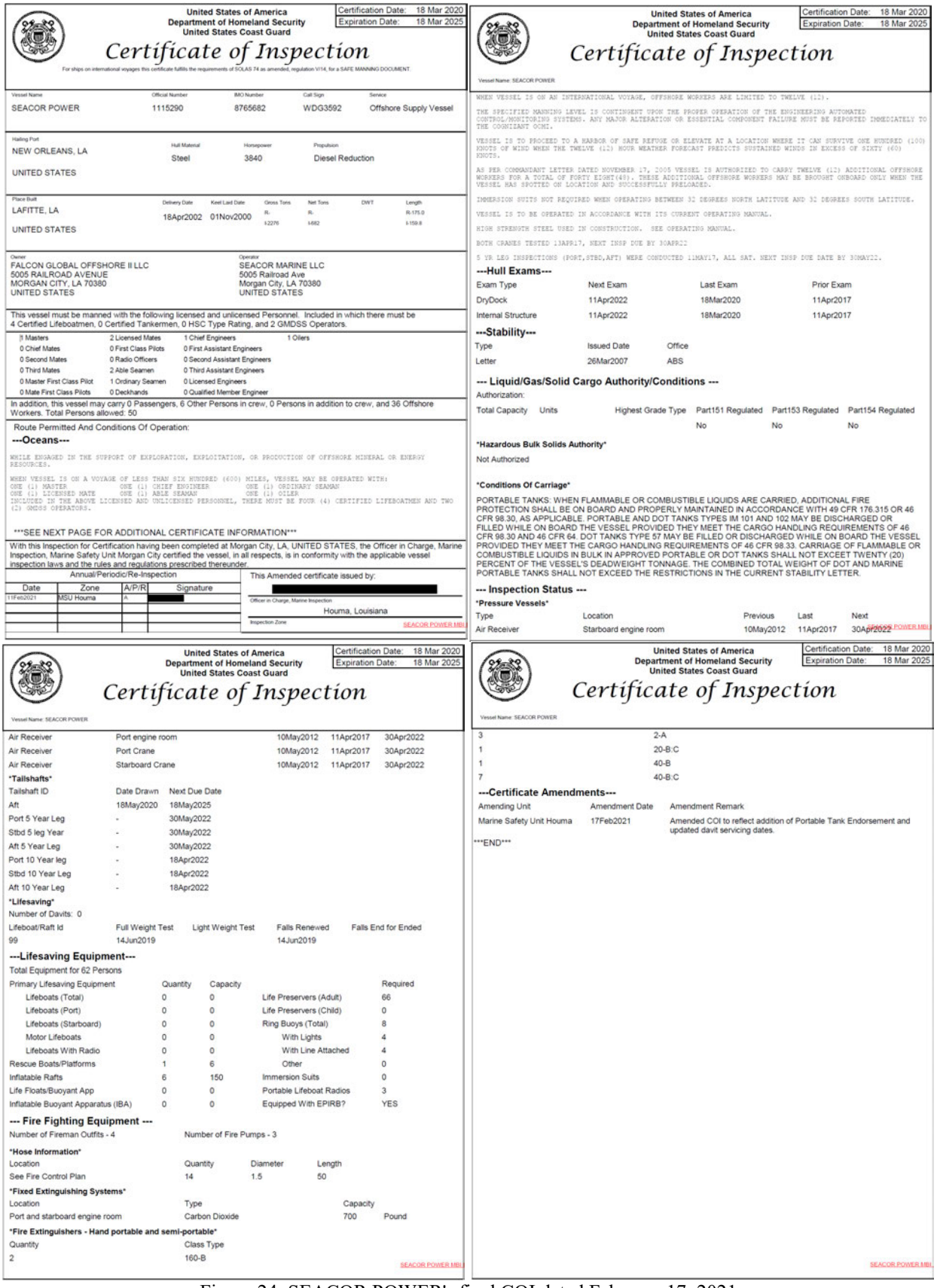
8.3.16. A vessel classed by ABS is required to obtain a new classification certificate every five years, which requires a vessel met all applicable ABS requirements for a classed vessel. On May 12, 2018, ABS issued a Classification Certificate to SEACOR POWER.

8.3.17. Liftboats inspected under 46 CFR Subchapter L and operating in salt water are required to be placed in drydock or hauled out for examination twice in each 5 year period, with no interval between examinations exceeding 3 years. These vessels are also required to perform Internal Structural Exams (ISEs) on the same interval as the drydock exams. On March 17, 2020, the Coast Guard completed a COI inspection, drydock examination, ISE, and a security inspection on SEACOR POWER. The Coast Guard inspector issued a new COI, which was valid for five years. The new COI contained the same routes and conditions as the previous COI.

8.3.18. On February 3, 2021, a Cargo Ship Radio Safety Certificate survey was completed and indicated that the vessel's radio equipment was in full regulatory compliance and rated for sea areas A1, A2, and A3.[118]

8.3.19. When the Coast Guard issues a COI that is valid for five years, the vessel must undergo annual inspections to verify that it remains in compliance with the COI. The Coast Guard conducted SEACOR POWER's annual inspection on February 11, 2021. The inspectors did not identify any deficiencies.

[118] Exhibit 219



United States of America
Department of Homeland Security
United States Coast Guard

Certificate of Inspection

Certification Date: 18 Mar 2020
Expiration Date: 18 Mar 2025

For ships on international voyages this certificate fulfills the requirements of SOLAS 74 as amended, regulation V/14, for a SAFE MANNING DOCUMENT.

Vessel Name	Official Number	IMO Number	Call Sign	Service
SEACOR POWER	1115290	8765682	WDG3592	Offshore Supply Vessel

Hailing Port: NEW ORLEANS, LA, UNITED STATES
Hull Material: Steel
Horsepower: 3840
Propulsion: Diesel Reduction

Place Built: LAFITTE, LA, UNITED STATES
Delivery Date: 18Apr2002
Keel Laid Date: 01Nov2000
Gross Tons: R- 12276
Net Tons: R- 1682
DWT:
Length: R-175.0 I-159.8

Owner: FALCON GLOBAL OFFSHORE II LLC, 5005 RAILROAD AVENUE, MORGAN CITY, LA 70380, UNITED STATES
Operator: SEACOR MARINE LLC, 5005 Railroad Ave, Morgan City, LA 70380, UNITED STATES

This vessel must be manned with the following licensed and unlicensed Personnel. Included in which there must be 4 Certified Lifeboatmen, 0 Certified Tankermen, 0 HSC Type Rating, and 2 GMDSS Operators.

1 Masters	2 Licensed Mates	1 Chief Engineers	1 Oilers
0 Chief Mates	0 First Class Pilots	0 First Assistant Engineers	
0 Second Mates	0 Radio Officers	0 Second Assistant Engineers	
0 Third Mates	2 Able Seamen	0 Third Assistant Engineers	
0 Master First Class Pilot	1 Ordinary Seamen	0 Licensed Engineers	
0 Mate First Class Pilots	0 Deckhands	0 Qualified Member Engineer	

In addition, this vessel may carry 0 Passengers, 6 Other Persons in crew, 0 Persons in addition to crew, and 36 Offshore Workers. Total Persons allowed: 50

Route Permitted And Conditions Of Operation:

---Oceans---

WHILE ENGAGED IN THE SUPPORT OF EXPLORATION, EXPLOITATION, OR PRODUCTION OF OFFSHORE MINERAL OR ENERGY RESOURCES.

WHEN VESSEL IS ON A VOYAGE OF LESS THAN SIX HUNDRED (600) MILES, VESSEL MAY BE OPERATED WITH:
ONE (1) MASTER ONE (1) CHIEF ENGINEER ONE (1) ORDINARY SEAMAN
ONE (1) LICENSED MATE ONE (1) ABLE SEAMAN ONE (1) OILER
INCLUDED IN THE ABOVE LICENSED AND UNLICENSED PERSONNEL, THERE MUST BE FOUR (4) CERTIFIED LIFEBOATMEN AND TWO (2) GMDSS OPERATORS.

SEE NEXT PAGE FOR ADDITIONAL CERTIFICATE INFORMATION

With this Inspection for Certification having been completed at Morgan City, LA, UNITED STATES, the Officer in Charge, Marine Inspection, Marine Safety Unit Morgan City certified the vessel, in all respects, is in conformity with the applicable vessel inspection laws and the rules and regulations prescribed thereunder.

Annual/Periodic/Re-Inspection

Date	Zone	A/P/R	Signature
11Feb2021	MSU Houma	A	[redacted]

This Amended certificate issued by:
[redacted]
Officer in Charge, Marine Inspection
Houma, Louisiana
Inspection Zone

SEACOR POWER MBR

United States of America
Department of Homeland Security
United States Coast Guard

Certificate of Inspection

Certification Date: 18 Mar 2020
Expiration Date: 18 Mar 2025

Vessel Name: SEACOR POWER

WHEN VESSEL IS ON AN INTERNATIONAL VOYAGE, OFFSHORE WORKERS ARE LIMITED TO TWELVE (12).

THE SPECIFIED MANNING LEVEL IS CONTINGENT UPON THE PROPER OPERATION OF THE ENGINEERING AUTOMATED CONTROL/MONITORING SYSTEMS. ANY MAJOR ALTERATION OR ESSENTIAL COMPONENT FAILURE MUST BE REPORTED IMMEDIATELY TO THE COGNIZANT OCMI.

VESSEL IS TO PROCEED TO A HARBOR OF SAFE REFUGE OR ELEVATE AT A LOCATION WHERE IT CAN SURVIVE ONE HUNDRED (100) KNOTS OF WIND WHEN THE TWELVE (12) HOUR WEATHER FORECAST PREDICTS SUSTAINED WINDS IN EXCESS OF SIXTY (60) KNOTS.

AS PER COMMANDANT LETTER DATED NOVEMBER 17, 2005 VESSEL IS AUTHORIZED TO CARRY TWELVE (12) ADDITIONAL OFFSHORE WORKERS FOR A TOTAL OF FORTY EIGHT(48). THESE ADDITIONAL OFFSHORE WORKERS MAY BE BROUGHT ONBOARD ONLY WHEN THE VESSEL HAS SPOTTED ON LOCATION AND SUCCESSFULLY PRELOADED.

IMMERSION SUITS NOT REQUIRED WHEN OPERATING BETWEEN 32 DEGREES NORTH LATITUDE AND 32 DEGREES SOUTH LATITUDE.

VESSEL IS TO BE OPERATED IN ACCORDANCE WITH ITS CURRENT OPERATING MANUAL.

HIGH STRENGTH STEEL USED IN CONSTRUCTION. SEE OPERATING MANUAL.

BOTH CRANES TESTED 13APR17, NEXT INSP DUE BY 30APR22

5 YR LEG INSPECTIONS (PORT,STBD,AFT) WERE CONDUCTED 11MAY17, ALL SAT. NEXT INSP DUE DATE BY 30MAY22.

---Hull Exams---

Exam Type	Next Exam	Last Exam	Prior Exam
DryDock	11Apr2022	18Mar2020	11Apr2017
Internal Structure	11Apr2022	18Mar2020	11Apr2017

---Stability---

Type	Issued Date	Office
Letter	26Mar2007	ABS

--- Liquid/Gas/Solid Cargo Authority/Conditions ---

Authorization:

Total Capacity	Units	Highest Grade Type	Part151 Regulated	Part153 Regulated	Part154 Regulated
			No	No	No

Hazardous Bulk Solids Authority

Not Authorized

Conditions Of Carriage

PORTABLE TANKS: WHEN FLAMMABLE OR COMBUSTIBLE LIQUIDS ARE CARRIED, ADDITIONAL FIRE PROTECTION SHALL BE ON BOARD AND PROPERLY MAINTAINED IN ACCORDANCE WITH 49 CFR 176.315 OR 46 CFR 98.30, AS APPLICABLE. PORTABLE AND DOT TANKS TYPES IM 101 AND 102 MAY BE DISCHARGED OR FILLED WHILE ON BOARD THE VESSEL PROVIDED THEY MEET THE CARGO HANDLING REQUIREMENTS OF 46 CFR 98.30 AND 46 CFR 64. DOT TANKS TYPE 57 MAY BE FILLED OR DISCHARGED WHILE ON BOARD THE VESSEL PROVIDED THEY MEET THE CARGO HANDLING REQUIREMENTS OF 46 CFR 98.33. CARRIAGE OF FLAMMABLE OR COMBUSTIBLE LIQUIDS IN BULK IN APPROVED PORTABLE OR DOT TANKS SHALL NOT EXCEET TWENTY (20) PERCENT OF THE VESSEL'S DEADWEIGHT TONNAGE. THE COMBINED TOTAL WEIGHT OF DOT AND MARINE PORTABLE TANKS SHALL NOT EXCEED THE RESTRICTIONS IN THE CURRENT STABILITY LETTER.

--- Inspection Status ---

Pressure Vessels

Type	Location	Previous	Last	Next
Air Receiver	Starboard engine room	10May2012	11Apr2017	30Apr2022

SEACOR POWER MBR

United States of America
Department of Homeland Security
United States Coast Guard

Certificate of Inspection

Certification Date: 18 Mar 2020
Expiration Date: 18 Mar 2025

Vessel Name: SEACOR POWER

Air Receiver	Port engine room	10May2012	11Apr2017	30Apr2022
Air Receiver	Port Crane	10May2012	11Apr2017	30Apr2022
Air Receiver	Starboard Crane	10May2012	11Apr2017	30Apr2022

Tailshafts

Tailshaft ID	Date Drawn	Next Due Date
Aft	18May2020	18May2025
Port 5 Year Leg	-	30May2022
Stbd 5 leg Year	-	30May2022
Aft 5 Year Leg	-	30May2022
Port 10 Year leg	-	18Apr2022
Stbd 10 Year Leg	-	18Apr2022
Aft 10 Year Leg	-	18Apr2022

Lifesaving

Number of Davits: 0

Lifeboat/Raft Id	Full Weight Test	Light Weight Test	Falls Renewed	Falls End for Ended
99	14Jun2019		14Jun2019	

---Lifesaving Equipment---

Total Equipment for 62 Persons

Primary Lifesaving Equipment	Quantity	Capacity		Required
Lifeboats (Total)	0	0	Life Preservers (Adult)	66
Lifeboats (Port)	0	0	Life Preservers (Child)	0
Lifeboats (Starboard)	0	0	Ring Buoys (Total)	8
Motor Lifeboats	0	0	With Lights	4
Lifeboats With Radio	0	0	With Line Attached	4
Rescue Boats/Platforms	1	6	Other	0
Inflatable Rafts	6	150	Immersion Suits	0
Life Floats/Buoyant App	0	0	Portable Lifeboat Radios	3
Inflatable Buoyant Apparatus (IBA)	0	0	Equipped With EPIRB?	YES

--- Fire Fighting Equipment ---

Number of Fireman Outfits - 4
Number of Fire Pumps - 3

Hose Information

Location	Quantity	Diameter	Length
See Fire Control Plan	14	1.5	50

Fixed Extinguishing Systems

Location	Type	Capacity	
Port and starboard engine room	Carbon Dioxide	700	Pound

Fire Extinguishers - Hand portable and semi-portable

Quantity	Class Type
2	160-B

SEACOR POWER MBR

United States of America
Department of Homeland Security
United States Coast Guard

Certificate of Inspection

Certification Date: 18 Mar 2020
Expiration Date: 18 Mar 2025

Vessel Name: SEACOR POWER

3	2-A
1	20-B:C
1	40-B
7	40-B:C

---Certificate Amendments---

Amending Unit	Amendment Date	Amendment Remark
Marine Safety Unit Houma	17Feb2021	Amended COI to reflect addition of Portable Tank Endorsement and updated davit servicing dates.

END

SEACOR POWER MBR

Figure 24: SEACOR POWER's final COI dated February 17, 2021

8.3.20. On that same day, February 11, 2021, ABS completed annual surveys for other statutory certificates including; Cargo Ship Safety Construction Certificate, Cargo Ship Safety Equipment Certificate, ABS Classification Certificate and International Load Line Certificates. Seacor rectified several minor findings, and ABS endorsed all of the certificates.[119]

8.3.21. 33 CFR 96 requires a company that operates a vessel with a Safety Management Certificate (SMC) to conduct an annual internal audit of the vessel. Seacor conducted an internal audit on SEACOR POWER from February to April 2021. The internal audit was still in progress on April 13, 2021.

8.3.22. On April 10, 2021, SEACOR POWER was underway, enroute Port Fourchon. As the vessel was transiting, the seas were hitting the hull on the starboard side, almost directly from the beam. When the waves hit the hull on the starboard side, they splashed up. At some point during the voyage, the waves hit one of the three starboard liferafts and knocked it out of the cradle. The liferaft fell overboard. The waves also damaged the grating on the platform around the starboard crane. The Off-Going Master notified the QHSE Manager about the incident. Later that day, a squall passed through the area, producing 35-40 knot winds from the north, peaking at 48 knots, and producing 3-5 foot swells from the north. The Off-Going Master lowered the liftboat legs and raised the hull out of the water until the weather passed. The liferaft and crane grating repairs were completed in Port Fourchon on the morning of April 13, 2021, before SEACOR POWER departed.

8.4 Stability Requirements and Vessel Stability

8.4.1. Regulatory stability requirements for inspected vessels, including liftboats are contained in 46 CFR Subchapter S. This subchapter contains requirements for stability plan approval, stability instructions for operating personnel, intact stability criteria, and determination of lightweight displacement and centers of gravity. This subchapter applied to SEACOR POWER at the time of construction.

8.4.2. ABS performed SEACOR POWER's stability reviews using the provisions of NVIC 3-97, which authorizes ABS to perform these reviews and to issue a stability letter on behalf of the U.S. Coast Guard. The Coast Guard did not perform oversight of ABS' review for SEACOR POWER.

8.4.3. Stability Booklets are required by 46 CFR 170, Subpart D, for all vessels, including liftboats. In addition, Liftboat Operating Manuals are required under 46 CFR 134.170, and are not explicitly exempt from the Stability Booklet requirement of 46 CFR 170, Subpart D. SEACOR POWER did not have a Stability Booklet, other than the Marine Operations Manual.

[119] Exhibit 52

8.4.4. The requirements for intact stability criteria for all vessels are found in 46 CFR 170, Subpart E. These intact stability criteria are not applicable to MODUs, as noted in 46 CFR 170.160(b)(2). However, liftboats are not listed under the exceptions, therefore the regulations require them to meet these intact stability criteria. The basic principle found in the intact stability criteria for all vessels (46 CFR 170.170) requires a given metacentric height (GM, initial slope of the righting arm curve) based on the amount of freeboard and moment generated by wind force. The second portion is for vessels of "unusual proportion and form" and requires a reserve amount of righting energy (area under the righting arm curve) at large fixed heel angles. Due to the unique design of many liftboats, including SEACOR POWER, these vessels cannot meet the requirements in 46 CFR 170, Subpart E. The Marine Safety Center and ABS have not historically applied these criteria to liftboats.

8.4.5. SEACOR POWER was required to meet 46 CFR 170, Subpart F. This required the owner of the vessel to conduct a stability test. As discussed in section 7.3, the test was completed after construction on March 25, 2002, and after the legs were extended on June 29, 2012. An ABS representative witnessed these tests and ABS issued approval letters for the lightship characteristics obtained from the test, satisfying the requirements of Subpart F.

8.4.6. 46 CFR 174 has stability rules specific to MODUs, OSVs, and liftboats, among other types of vessels. As a liftboat inspected under 46 CFR Subchapter L, SEACOR POWER was required to meet the liftboat-specific requirements in 46 CFR 174, Subpart H.

8.4.7. Of note, a liftboat inspected under 46 CFR Subchapter I is not required to meet the provisions of 46 CFR 174, Subpart H, yet as discussed above, a liftboat could not meet the intact stability requirements of 46 CFR 170, Subpart E. It is not clear how a liftboat inspected under 46 CFR Subchapter I could satisfy statutory stability requirements.

8.4.8. Coast Guard stability regulations and ABS Rules for Building and Classing MODUs (ABS MODU Rules) do not evaluate floating stability with wave conditions. All of the required stability analyses for SEACOR POWER were evaluated in still water conditions, meaning the vessel was in a static condition (not in waves and only after attaining equilibrium between overturning wind force and restoring buoyant force). It is important to note that 60 and 70-knot wind conditions with no waves is a regulatory condition only and not a realistic condition that could be physically encountered by a vessel.

8.4.9. Within 46 CFR 174, there are two options for compliance for liftboats. The first option is defined as unrestricted service, and liftboats in unrestricted service must meet the stability requirements for MODUs contained in 46 CFR 174, Subpart C. Within Subpart C, the basic principle for intact stability requires compliance with four criteria in prescribed wind conditions. The unrestricted wind speeds required for regulatory analysis are 70 knot winds for normal operating conditions, and 100 knot winds for severe storm conditions.

8.4.10. Restricted Service is defined as “service in areas within 12 hours of a harbor of safe refuge where a liftboat may be jacked up to meet the 100-knot-wind severe storm criteria of 46 CFR 174.255(c)” which applied to SEACOR POWER. For restricted service, the

regulations require a comparison of the vessel's righting moment (the ability of the vessel to return to an upright condition) to the overturning moment generated by the force of the wind. Four intact stability criteria are required by 46 CFR 174. The Coast Guard's Marine Safety Center (MSC) Post-Casualty Stability Analysis[120] provides additional descriptions of these criteria. For these restricted service criteria, the wind force is calculated using 60 knots of wind for the normal operating condition and 70 knots of wind for the severe-storm conditions.

8.4.11. SEACOR POWER's COI contains an endorsement that required the vessel to "proceed to a harbor of safe refuge or elevate at a location where it can survive 100 knots of wind when the 12 hour weather forecast predicts sustained winds in excess of sixty knots."[121]

8.4.12. The requirements in 46 CFR 174, Subpart H also include damaged stability calculations that are evaluated based on wind heeling moments using a 50-knot wind speed.

8.4.13. The method to calculate the wind force on the vessel (wind heeling moment) is outlined in 46 CFR 174.055 for both restricted and unrestricted service. This method of calculating the wind heeling moment adds together the individual wind heeling moments for each exposed surface area of the vessel's profile. The formula increases the force of the wind as the height above the water increases, and it also uses a coefficient to represent the force of the wind on different shaped components of the superstructure. The Chief of the Naval Architecture Division in the Coast Guard Office of Design and Engineering Standards stated that these regulations were developed in the 1960's and have not been updated recently, although MODUs have evolved considerably from that time period.

8.4.14. One method of intact stability calculation within 46 CFR 174, Subpart H requires a comparison of the righting arm curve to the overturning arm curve. For restricted liftboats, 46 CFR 174.255(a)(1)(i) requires the vessel to have 40% more area under the righting arm curve compared to the heeling arm curve; the ratio between the two must be greater than 1.4. This value is known as the "k" factor and was described as the safety factor by the Chief of the Naval Architecture Division in the Coast Guard Office of Design and Engineering Standards.

8.4.15. Using 46 CFR 174.055, the force of the wind is calculated as a step function (set values for certain levels) because computers were not widely used at the time the requirements were created. Additionally, the magnitude of increase in wind speed with increasing height above the waterline is not as conservative as those found in other portions of the regulations (46 CFR Subchapter C) and other professional standards, such as the American Petroleum Institute (API) 2A-WSD standard and the Norwegian Petroleum Directorate standard.[122]

[120] Exhibit 246
[121] Exhibit 32
[122] Exhibit 246

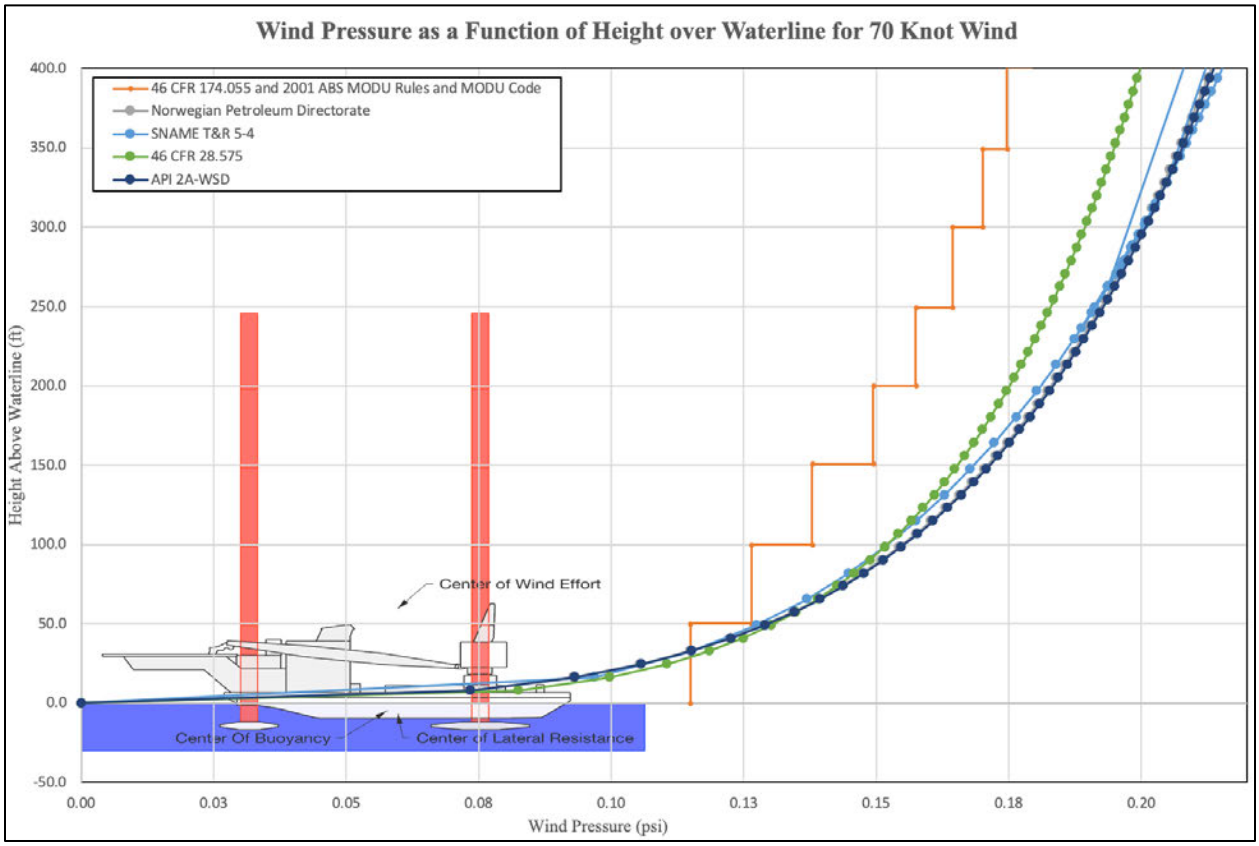


Figure 25: Comparison of wind pressure changes vs. height for a 70-knot wind (at 33 feet) for different technical and regulatory standards with SEACOR POWER profile shown for reference (Exhibit 246)

8.4.16. The "shape coefficients" prescribed in Table 46 CFR 174.055(b) representing the force of the wind on different shaped components were examined in a technical paper written by ABS and GustoMSC in 2019. This paper demonstrates that the drag coefficients for cylinders with racks (the teeth used on the liftboat jacking system) are listed in the regulations as 0.5, but could actually be 4 times greater than that.[123]

8.4.17. To evaluate off-axis stability and determine the critical axis, naval architects rotate the inclination axis. This method ensures that righting arms plots are showing the inclination and righting arms of the vessel in the direction parallel with the wind. However, this method is limited by cases where the vessel tips in the direction orthogonal to the wind and inclination direction. This limitation is called "fading stability." The regulations and Coast Guard policy do not address this situation, but the Chief of the Naval Architecture Division of the Coast Guard's Office of Design and Engineering Standards testified that the problems related to critical axis have been known prior to the casualty and studies were planned. ABS has a method to address fading stability, but it only came into effect in 2005, after certification of SEACOR POWER's stability.

[123] Exhibit 246

8.4.18. In 2002, SEMCO performed a stability analysis for SEACOR POWER using the 46 CFR 174 Criteria and the ABS MODU Rules.[124] They examined wind encountering the vessel from different directions, spaced at 30 degree axis-rotation intervals for the ABS MODU Criteria but only for the beam wind for regulatory criteria. ABS marked SEMCO's stability analysis "Not Examined."[125]

8.4.19. As part of its review in 2002, ABS independently analyzed intact and damaged stability for SEACOR POWER using their in-house computer program named DrilWind. ABS used the requirements found in their Rules for Building and Classing Mobile Offshore Drilling Units (2001) to conduct the stability analysis. These rules use different stability criteria than 46 CFR 174, as shown in the MSC Post-Casualty Stability Analysis. [126] Additionally, ABS explicitly requires the wind force to be analyzed from any horizontal direction. For restricted service, ABS MODU Rules allow the designer to specify the wind speed, but it cannot be less than 50 knots. For SEACOR POWER, ABS created a model of the vessel and examined wind impacting the vessel from different directions, spaced at 15 degree intervals. Based on these calculations, ABS established a table of maximum VCGs for a range of vessel drafts. They performed all of these calculations using zero intial trim. SEACOR POWER passed all of the ABS criteria. The resulting VCGs were significantly lower (more conservative) than the ones calculated by SEMCO as shown in figure.[127]

[124] Exhibit 266
[125] Exhibit 266
[126] Exhibit 246
[127] Exhibit 55

Leg Length:	265'	ABSID:		Unit:	DIXIE ENDEAVOR		
TOC:	2.5' ABL	Date:		Builder:	Semco 1009		
Buoyancy:	Buoyant		Engineer:	BR			

	Submitted			ABS			
Draft	Int 60	Int 70	Dam 50	Int 60	Int 70	Dam 50	AVCG
8	80.36	74.99	74.99	58.00	55.00	84.60	55.00
8.5	74.81	69.77	69.77	53.10	50.00	77.65	50.00
9	69.13	64.35	64.35	47.80	45.50	69.71	45.50
9.5	62.86	58.76	58.76	41.50	39.50	59.30	39.50
10	56.12	52.16	52.16	35.50	35.05	48.70	35.05

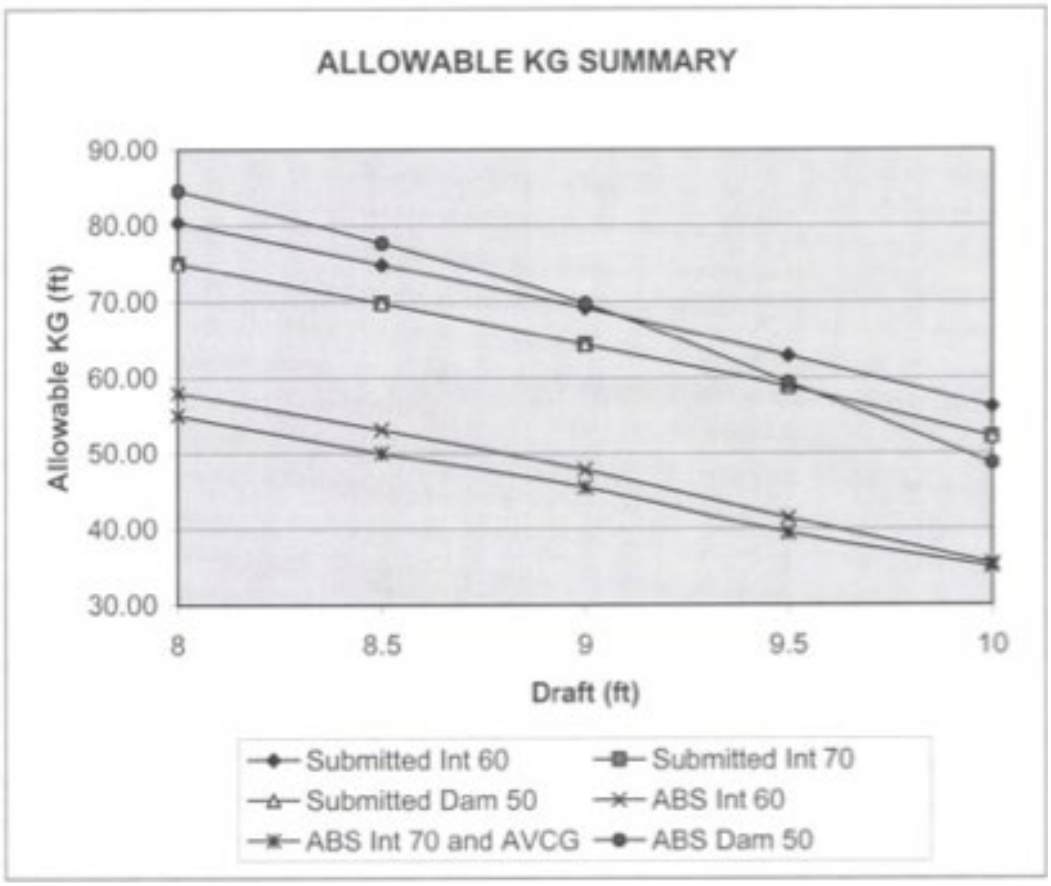
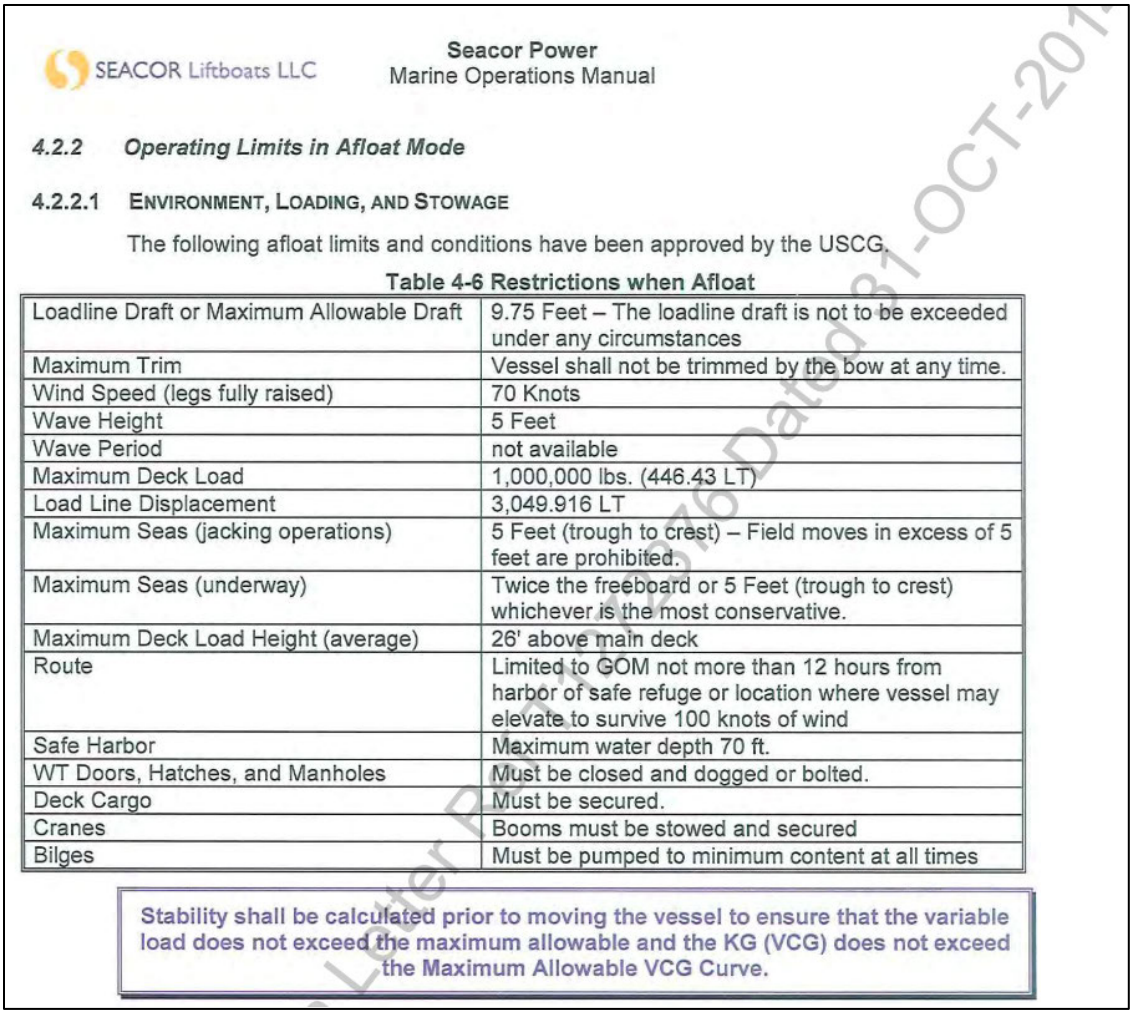


Figure 26: ABS comparison of Allowable Verical Center of Gravity for SEACOR POWER as calcualted by SEMCO and ABS (Exhibit 55)

8.4.20. 46 CFR 134.170 required liftboats to have an approved operating manual which included information on a variety of topics listed in paragraphs 1 through 16 of the regulation. The regulation also stated that the operating manual must be easily understood by the crewmembers. For SEACOR POWER, Intact Stability Guidance in the Marine Operations Manual was located in several sections, including: Section 4.1: Lightship and

Variable load, Section 4.2: Operating Limits, Section 5: Moving the Liftboat, Section 6.1.2: Abnormal Operations – Heavy Weather – Afloat, and Section 8: Stability.[128]



SEACOR Liftboats LLC

Seacor Power
Marine Operations Manual

4.2.2 Operating Limits in Afloat Mode

4.2.2.1 ENVIRONMENT, LOADING, AND STOWAGE

The following afloat limits and conditions have been approved by the USCG.

Table 4-6 Restrictions when Afloat

Loadline Draft or Maximum Allowable Draft	9.75 Feet – The loadline draft is not to be exceeded under any circumstances
Maximum Trim	Vessel shall not be trimmed by the bow at any time.
Wind Speed (legs fully raised)	70 Knots
Wave Height	5 Feet
Wave Period	not available
Maximum Deck Load	1,000,000 lbs. (446.43 LT)
Load Line Displacement	3,049.916 LT
Maximum Seas (jacking operations)	5 Feet (trough to crest) – Field moves in excess of 5 feet are prohibited.
Maximum Seas (underway)	Twice the freeboard or 5 Feet (trough to crest) whichever is the most conservative.
Maximum Deck Load Height (average)	26' above main deck
Route	Limited to GOM not more than 12 hours from harbor of safe refuge or location where vessel may elevate to survive 100 knots of wind
Safe Harbor	Maximum water depth 70 ft.
WT Doors, Hatches, and Manholes	Must be closed and dogged or bolted.
Deck Cargo	Must be secured.
Cranes	Booms must be stowed and secured
Bilges	Must be pumped to minimum content at all times

Stability shall be calculated prior to moving the vessel to ensure that the variable load does not exceed the maximum allowable and the KG (VCG) does not exceed the Maximum Allowable VCG Curve.

Figure 27: Seacor Operations Manual Excerpt

8.4.21. Table 4-6 in SEACOR POWER's Marine Operations Manual provided a one-page summary of afloat limits and conditions that "have been approved by the USCG." However, additional stability restrictions were placed on the vessel in other sections of the Marine Operations Manual, such as page 8-6, which stated "the vessel afloat should have not more than 6 inches of trim by the stern." Additionally, some restrictions listed in table 4-6 did not appear as ABS or Coast Guard requirements for the vessel, such as "the vessel shall not be trimmed by the bow at any time and" the limiting wave height of 5 feet or twice the freeboard."[129]

[128] Exhibit 59
[129] *Id.*

8.4.22. To ensure SEACOR POWER met stability criteria, the crew was required to perform a calculation demonstrating that loading of SEACOR POWER did not exceed the maximum vertical center of gravity at the operating draft. This required the calculation of SEACOR POWER's weight and center of gravity by adding the contributions of lightship (as determined from the 2012 stability test), personnel and crew effects, tank loads, and cargo loads. The resulting vertical center of gravity was compared to the allowable VCG curve appearing on page 8-25 of the Marine Operations Manual. The Manual provided calculation sheets on pages 8-5 and 8-6, which the crew could use to perform this calculation. [130] Crewmembers testified that they used a computer spreadsheet to do this calculation aboard SEACOR POWER.

8.4.23. Cameras in Port Fourchon recorded SEACOR POWER's departure on April 13, 2021. SEACOR POWER's observed draft was 9.25 feet at the Plimsol mark (the waterline was at the bottom of the ring). SEACOR POWER had approximately 2.5 feet of aft trim as observed using the number of forward and aft draft marks visible on the port side. Heel angle could not be observed from camera angles.[131]

Figure 28: SEACOR POWER Departing Port Fourchon on April 13, 2021

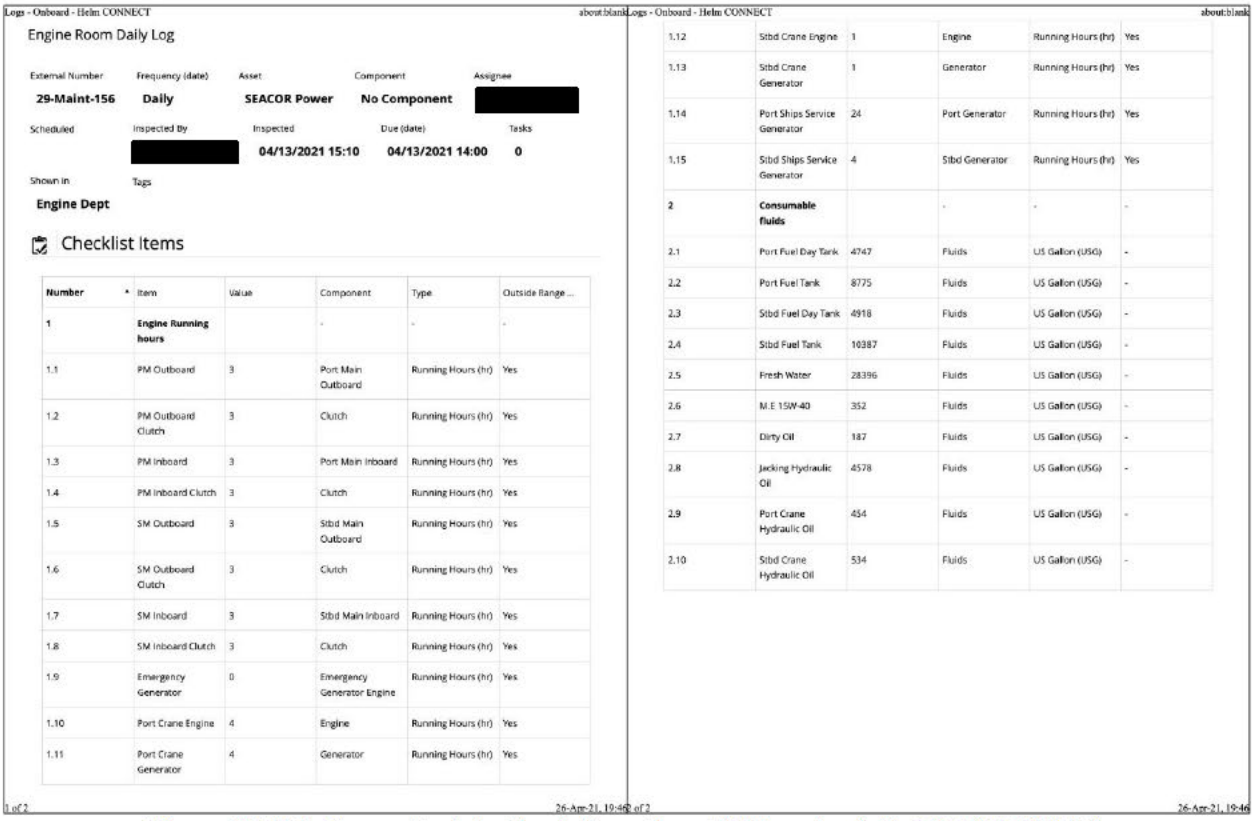
8.4.24. The Off-Boat Master stated that the trim shown in the departure condition was normal. He stated that the draft marks on the bow normally read between seven or eight feet, and the draft marks on the stern normally read between 14 and 15 feet. He also noted that the reference line for the draft marks on the bow and the stern were four feet different, so you had to subtract four feet from the stern readings to calculate the trim. He stated that two feet of trim was pretty normal, three feet of trim would cause concern, and six inches of

[130] Exhibit 59
[131] Exhibit 185

trim was not reasonable to achieve. The First Mate stated that the draft marks normally read between seven and eight feet on the bow, and around 13.5 feet on the stern.

8.4.25. Cargo delivered to the vessel was recorded on manifests for each company. The cargo manifests identified a total of 217,519 pounds (97.11 long tons) of cargo aboard SEACOR POWER on April 13, 2021.[132]

8.4.26. The consumable tank loading aboard SEACOR POWER was reported by the onboard HelmConnect system at 1510, just prior to casualty.[133] This tank loading is shown in the following figure.



Logs - Onboard - Helm CONNECT about:blank

Engine Room Daily Log

External Number	Frequency (date)	Asset	Component	Assignee
29-Maint-156	Daily	SEACOR Power	No Component	[redacted]

Scheduled	Inspected By	Inspected	Due (date)	Tasks
	[redacted]	04/13/2021 15:10	04/13/2021 14:00	0

Shown in: Engine Dept

Checklist Items

Number	Item	Value	Component	Type	Outside Range ...
1	Engine Running hours		-	-	-
1.1	PM Outboard	3	Port Main Outboard	Running Hours (hr)	Yes
1.2	PM Outboard Clutch	3	Clutch	Running Hours (hr)	Yes
1.3	PM Inboard	3	Port Main Inboard	Running Hours (hr)	Yes
1.4	PM Inboard Clutch	3	Clutch	Running Hours (hr)	Yes
1.5	SM Outboard	3	Stbd Main Outboard	Running Hours (hr)	Yes
1.6	SM Outboard Clutch	3	Clutch	Running Hours (hr)	Yes
1.7	SM Inboard	3	Stbd Main Inboard	Running Hours (hr)	Yes
1.8	SM Inboard Clutch	3	Clutch	Running Hours (hr)	Yes
1.9	Emergency Generator	0	Emergency Generator Engine	Running Hours (hr)	Yes
1.10	Port Crane Engine	4	Engine	Running Hours (hr)	Yes
1.11	Port Crane Generator	4	Generator	Running Hours (hr)	Yes

1 of 2 26-Apr-21, 19:46

Logs - Onboard - Helm CONNECT about:blank

1.12	Stbd Crane Engine	1	Engine	Running Hours (hr)	Yes
1.13	Stbd Crane Generator	1	Generator	Running Hours (hr)	Yes
1.14	Port Ships Service Generator	24	Port Generator	Running Hours (hr)	Yes
1.15	Stbd Ships Service Generator	4	Stbd Generator	Running Hours (hr)	Yes
2	Consumable fluids		-	-	-
2.1	Port Fuel Day Tank	4747	Fluids	US Gallon (USG)	-
2.2	Port Fuel Tank	8775	Fluids	US Gallon (USG)	-
2.3	Stbd Fuel Day Tank	4918	Fluids	US Gallon (USG)	-
2.4	Stbd Fuel Tank	10387	Fluids	US Gallon (USG)	-
2.5	Fresh Water	28396	Fluids	US Gallon (USG)	-
2.6	M.E 15W-40	352	Fluids	US Gallon (USG)	-
2.7	Dirty Oil	187	Fluids	US Gallon (USG)	-
2.8	Jacking Hydraulic Oil	4578	Fluids	US Gallon (USG)	-
2.9	Port Crane Hydraulic Oil	454	Fluids	US Gallon (USG)	-
2.10	Stbd Crane Hydraulic Oil	534	Fluids	US Gallon (USG)	-

2 of 2 26-Apr-21, 19:46

Figure 29: HelmConnect tank loading information at 1510 on April 13, 2021 (Exhibit 86)

8.5 Crew Training and Experience

8.5.1. SEACOR POWER's leadership team had significant relevant experience aboard the vessel and in the maritime industry.

8.5.2. The Master's wife estimated that he had been in the offshore industry since 1980, and that he had served as a vessel master for about 24 years.[134] The First Mate stated that he

[132] Exhibits 24-30
[133] Exhibit 86
[134] Exhibit 223

trained under the Master while on SEACOR POWER for at least two years, and the Master had run SEACOR LEGACY, a vessel of similar design to SEACOR POWER, for as long as the First Mate could remember.[135] The Seacor General Manager said that the Master was running SEACOR POWER's sister vessel since at least 2007, when he joined the company.

8.5.3. Supervisors, subordinates, and clients of the Master all shared the opinion that the Master was a good captain. The First Mate stated that the Master was a "[v]ery well Captain and he taught me a lot. He was a great guy." When asked about his impression of the Master, the Company Man said "he was very conservative, very good at his job."

8.5.4. The Master's wife also reported the Master's conservative nature, stating "[P]eople have spoke about knowing he wasn't one to take chances. He didn't do it at work, and he didn't even do it at home. If we were out boating, if weather looked iffy, we cancelled all plans."[136]

8.5.5. The First Mate served on Seacor-acquired liftboats since 2004, and he worked in the offshore industry since 2002. The First Mate stated that he moved into his current position on SEACOR POWER about two years ago, and that he had served on SEACOR POWER for a total of approximately seven years.

8.5.6. The Night Captain served on Seacor-acquired liftboats since 1985, and he worked in the offshore industry since 1979.[137]

8.5.7. Additionally, all of the SEACOR POWER crew, except for the Night Captain, were born in Louisiana and reported current addresses in Louisiana.[138]

8.5.8. Seacor maintained several years of annual employee evaluations for the Master, Night Captain, First Mate, Chief Engineer, and Assistant Chief Engineer. Each evaluation showed the employees were meeting expectations. None of the evaluations noted any significant issues or any areas that needed improvement.[139]

8.5.9. SEACOR POWER maintained a matrix to document completion of required training and drills.[140] The QHSE Manager testified that Seacor maintained a 52-week training program for vessels, which covered every section of the SMS. Following an incident investigation, Seacor would implement weekly or quarterly "learning points" training to ensure relevant information was passed to the fleet, depending on the severity of the incident.

[135] Exhibit 235
[136] Exhibit 223
[137] Exhibit 111
[138] Exhibit 257
[139] Exhibit 258
[140] Exhibit 65

8.5.10. The figure below illustrates each of the crew's qualifications and relevant training experience.

Seacor Marine Personnel Onboard		Relevant Training								
Title/Name	**Merchant Mariner Credential**	**GMDSS Radio Operator's License**	**Lift boat Stability**	**Helicopter Underwater Escape**	**First Aid & CPR**	**Personal Survival**	**Leadership & Managerial Skills**	**Basic Training Revalidation**	**Bridge Resource Management**	**Lifeboatman/ Survival Craft**
Master Ledet	Master of vessels up to 3,000 GT, near coastal; OICNW, near coastal	X	X	X	X	X	X	X	X	X
First Mate [redacted]	Master of vessels up to 500 GT, near coastal; OICNW on vessels up to 3,000 GT; Mate of vessels up to 1,600 GRT	X		X	X	X	X	X	X	X
Night Captain [redacted]	Master of vessels up to 1,600 GT, near coastal; OICNW, near coastal	X	X	X	X	X	X	X	X	X
Chief Engineer Encalade	Chief Engineer on OSV's up to 3,000 kW/4,000 HP; OICEW on vessels up to 3,000 GT			X	X	X	X			X
Assistant Chief Engineer [redacted]	Chief Engineer on OSVs up to 3,000 kW/4,000 HP; OICEW on OSVs up to 3,000 GT			X	X	X	X	X		X
A/B 1 [redacted]	Master of vessels up to 500 GT, near coastal			X	X	X		X		
A/B 2 Morales	Master of vessels up to 500 GT, near coastal	X		X	X	X	X		X	
A/B 3 [redacted]	Able Seafarer- Deck			X	X	X		X		X
Cook 1 (O/S) Hartford	Vessel Personnel with Designated Security Duties, Security Awareness			X	X	X				
Cook 2 (O/S) [redacted]	Ordinary Seaman Wiper, Steward's Dept. (F.H.)									
Galley Hand (O/S) Walcott	Ordinary Seaman Wiper, Steward's Dept. (F.H.)			X						

Figure 30: Seacor training matrix (Exhibit 65)

8.5.11. Cardinal Worker 4[141] and the Company Man said they completed safety training courses, which covered topics including personal survival, lift rafts, safe rigging, and first aid and CPR. Cardinal Worker 2 said he completed Helicopter Underwater Egress Training (HUET), which covered personal survival.[142]

[141] Exhibit 224
[142] Exhibit 109

8.6 Post Casualty Testing

8.6.1. The First Mate, the Night Captain and A/B 1 received post-casualty drug and alcohol testing. All of the tests returned negative results.[143] The remaining survivors, the Company Man, Cardinal Worker 2, and Cardinal Worker 4, were not considered part of the crew and were therefore not subject to testing under 46 CFR 4.06. No test results were provided for these individuals.

8.6.2. The Lafourche Parish Coroner performed a post-mortem toxicology analysis for each of the deceased individuals and documented those results. In each case, the coroner tested samples of the individual's cardiac blood, urine, and vitreous fluid. No alcohol or chemicals were detected in the Master. There were various levels of alcohol and/or chemicals detected in the other deceased individuals, but the Coroner explained that these results were indicative of decay due to the recovery times. The Coroner also stated that there was no indication of illicit drug or alcohol consumption associated with any of the deceased individuals.[144]

8.7 Vessel Operations

8.7.1. As discussed in section 8.2 above, SEACOR POWER was on charter to Talos Energy on the date of the incident. As noted in the charter agreement, Seacor manned and operated the vessel, and also provided food and bunking for Talos' contracted personnel.[145] Talos' contracted personnel were not considered members of the crew, so they fell into the category of offshore workers, as defined by 46 CFR 125.160.

8.7.2. The Seacor Operations Manager stated that the vessel's schedule was coordinated between the Master and the client (Talos). The Talos Logistics Manager stated that the project engineer provided the requested schedule for each job. Seacor's salespeople told Talos when the vessels were available, and the project engineer worked with Seacor's sales team to set the vessel's schedule.

8.7.3. Talos had a policy to provide its own GPS tracking equipment to vessels under its charter, including SEACOR POWER.

8.7.4. Typically, vessels that were on charter to Talos would tie up at the Talos dock. SEACOR POWER did not fit at the Talos dock, so on the morning of April 13th, the vessel was moored at the Bollinger Dock.

[143] Exhibit 234
[144] Exhibit 233
[145] Exhibit 123

8.7.5. When in port and dockside, SEACOR POWER would not tie up to the dock like a traditional vessel. Instead, the vessel would jack down the legs, and jack the hull up partially or entirely out of the water next to the dock. The First Mate stated that they usually tried to place the main deck so that it was level with the dock, but they could not always do that, and would sometimes go up higher. The Operations Manual stated that the crew was not allowed to use the cranes or shift deck cargo while the vessel was afloat or underway.[146]

8.7.6. The SEACOR POWER crews typically worked 14 days on and 14 days off. The Off-Boat Chief Engineer stated that on the date of the incident, the two crews were in the middle of a 7 day on and 7 day off rotation, which was planned to allow the crews to switch the watch in preparation for the holidays. The oncoming crewmembers met at the office, and then rode to the Bollinger Dock in two Seacor crew change vehicles.

8.7.7. Anytime a new crew arrived on SEACOR POWER, the crewmembers conducted a handover meeting with their off going counterpart. The First Mate stated that on the morning of April 13th, his handover meeting covered maintenance items, including ongoing repairs to the vessel's starboard leg tower and replacement of the middle liferaft on the starboard side, which was lost during the previous voyage. The First Mate also stated that the mate from the other hitch had already created a voyage plan, so they reviewed it together. The Off-Boat Master said his handover meeting lasted about 45 minutes, and covered the condition of the vessel, information about the future job and the time frame associated with that job, and the ongoing repairs to the deck grating and the liferaft. The Off-Boat Chief Engineer said his handover meeting covered outstanding maintenance issues, lingering repairs, the condition of the vessel, and the load out.

8.7.8. On the morning of the incident, the Company Man and six of the seven other offshore workers, went to Talos' dock first, so that they could check in. After check in, the Company Man and the six other offshore workers rode in vehicles to the Bollinger Dock, and they boarded SEACOR POWER. The seventh offshore worker did not check in at Talos' dock.

8.7.9. 46 CFR 15.1105 requires all crewmembers to receive vessel familiarization training, which includes emergency procedures. SEACOR POWER's SMS required the Master to complete a joining checklist and vessel familiarization for new crewmembers.[147] Seacor's internal audit of the vessel noted that the Master completed the crew's joining checklists and vessel familiarizations at the beginning of 2021.[148]

8.7.10. According to 46 CFR 131.530, SEACOR POWER was required to conduct an abandon ship drill every other week. Also, if the crew changed more than once in a 2 week period, then an abandon ship drill had to be held as soon as practicable after the arrival of

[146] Exhibit 59
[147] Exhibit 78
[148] Exhibit 83

each crew. 46 CFR 131.535 required SEACOR POWER to conduct a fire drill every other week, and not later than 24 hours after the vessel left port.

8.7.11. Cardinal Worker 4 stated that there were no drills held on SEACOR POWER the day of the incident.[149]

8.7.12. Prior to getting underway, the Master was required to provide a safety orientation to the offshore workers, in accordance with 46 CFR 131.320. On the day of the incident, the Master held the orientation on the messdeck at 0630. The First Mate and the Night Captain stated that the orientation covered crane safety, drills, abandon ship procedures, muster and liferaft locations, and lifejackets. The Company Man stated that the orientation lasted 15-20 minutes and covered crane safety, prohibited areas, muster locations, and lifejackets. Cardinal Worker 2 stated that it was a general orientation that covered prohibited areas and coronavirus (COVID-19) procedures. Cardinal Worker 4 stated that the orientation included a Job Safety Analysis, as well as topics related to crane safety, not going on deck while underway, and muster areas.

8.7.13. Once the safety orientation was completed on April 13th, the crew began loading cargo onto the vessel. The Company Man stated that they were not allowed to use the SEACOR POWER cranes when there was lightning in the area, and that they would stop work if there was lightning within 10 miles. Between 0700 and 1200, the crew loaded approximately 10 truckloads of cargo on the main deck. An A/B used a SEACOR POWER crane to move each item from the Bollinger Dock onto the vessel. The Master told the A/Bs to place the heavy items in the middle of the deck. As each item was loaded, the A/B decided where to place each item on deck and measured the weight with the crane's load cell. The A/B reported the weight of each item by radio, and the other A/Bs, and at times the First Mate, recorded the weight and location of the cargo loads. Cardinal, Fugro, and Major Equipment personnel assisted with the cargo. The cargo was not secured to the deck of the vessel.

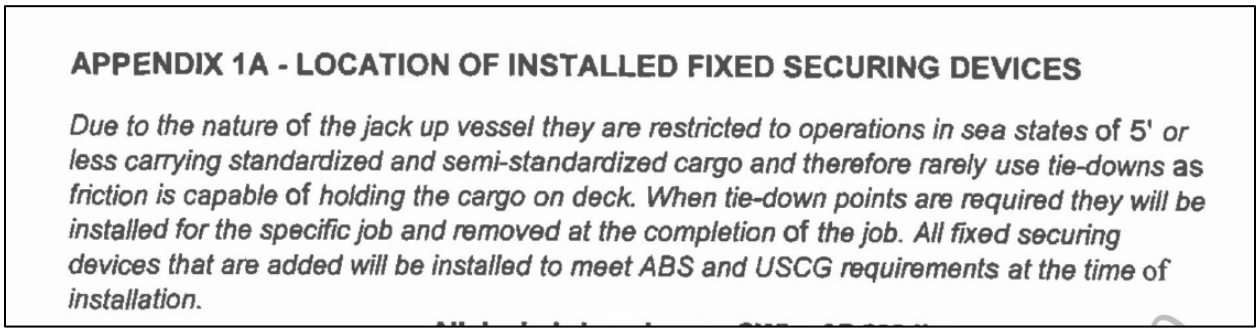
8.7.14. The First Mate said that cargo securing was the Captain's decision. The Company Man said that he has never seen cargo secured on a liftboat. The Off-Boat Master stated that cargo may get secured on a long voyage (more than 8-12 hours), but it depended on a number of factors, including weather and weight of the cargo.

8.7.15. The SEACOR POWER Operations Manual, page 5-4, said that cargo shall be bound to the nearest securing point. It also stated that cargo shall be bound to securing points with chains and ratchet binders.[150]

8.7.16. The SEACOR POWER Cargo Securing manual stated that cargo should be secured in an appropriate manner. The manual contained general statements about keeping cargo secured and included details about how to secure certain types of cargo, but the manual

[149] Exhibit 224
[150] Exhibit 59

did not incorporate specific statements about what must be done to secure cargo. Appendix 1A of the manual stated that due to the nature of a jack up vessel (liftboat), the vessel was restricted to operations in sea states of 5' or less, and therefore tie-downs were rarely used because friction was capable of holding the cargo on deck.[151] The Seacor Operations Manager stated that the vessel's cargo doesn't always have to be secured with chains. He said that the friction caused by non-skid could be a method of securing cargo.



APPENDIX 1A - LOCATION OF INSTALLED FIXED SECURING DEVICES

Due to the nature of the jack up vessel they are restricted to operations in sea states of 5' or less carrying standardized and semi-standardized cargo and therefore rarely use tie-downs as friction is capable of holding the cargo on deck. When tie-down points are required they will be installed for the specific job and removed at the completion of the job. All fixed securing devices that are added will be installed to meet ABS and USCG requirements at the time of installation.

Figure 31:: Cargo Securing Manual excerpt (Exhibit 115)

8.7.17. The First Mate said that on the day of the incident, while SEACOR POWER was underway, he did not see any deck cargo or equipment move at all until the vessel rolled, at which point he said it started sliding.

8.7.18. The SEACOR POWER Marine Operations Manual stated that the master had command of the vessel and all safety aspects related to it, and the mate had command of the vessel in the absence of the master. It also said that the engineer was responsible for ensuring the main and auxiliary machinery was working properly, and for maintaining the machinery.[152] The A/Bs were the crane operators, and they were responsible for general deck and crane monitoring.[153] On the day of the incident, an additional seasoned captain was aboard SEACOR POWER. The vessel's Certificate of Inspection did not require this additional captain. He was serving as the Night Captain, and he was assisting the Master and the First Mate with maintenance and computer work.[154]

8.7.19. The Marine Operations Manual stated that the Master shall monitor the weather every eight hours for normal operations and every four hours whenever a heavy weather forecast is pending.[155]

8.7.20. Every morning the Seacor Dispatcher emailed weather data to a number of Seacor vessels. The Dispatcher acquired the weather data from a Buoy Weather subscription service. The weather data covered an approximate area that included Port Fourchon and

[151] Exhibit 115
[152] Exhibit 59
[153] Exhibit 110
[154] Exhibit 111
[155] Exhibit 59

Cat Island Pass, between coordinates 28.91°N and 89.99°W.[156] This weather report was sent out as a general guide for Seacor vessels in that operational area.

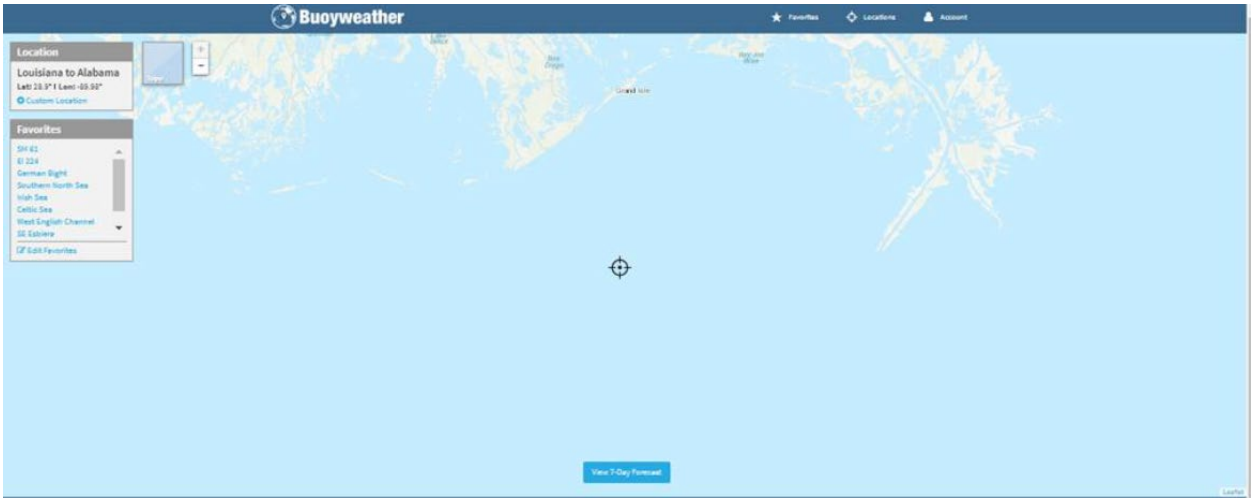


Figure 32: Buoy Weather coordinates used by Seacor Dispatcher for weather forecast distributed on April 13, 2021 (Exhibit 203)

8.7.21. The Off-Boat Master stated that Seacor also provided access to the Buoy Weather application, and he could get to that information on his phone and the ship's computer. There was not a computer on SEACOR POWER's bridge, though, so he had to go down below to access information on the computer. The Off-Boat Master stated that he could obtain an additional forecast by calling the Seacor Dispatcher. He also said that NAVTEX was another way to obtain weather, and you could see the messages on the NAVTEX screen, or you could press a button to print them out.

8.7.22. The Operations Manager stated that Seacor did not have anyone ashore who was continuously monitoring the weather. He said if that if the weather changed during the day, he was not aware of anyone sending an update to the vessels. If a vessel called him and requested a forecast, he would send it to them.

8.7.23. The Company Man stated that Talos provided weather forecasts to him every morning. In addition, he said that he used to have access to obtain forecasts from other sources as well, but that he had lost his passwords and could no longer use those other sources. The Talos Logistics Manager stated that Weather Ops DTN provided the forecasts for Talos. He said that the Talos weather forecasts were sent to a large distribution list, including Talos operations personnel and company representatives.

8.7.24. The Marine Operations Manual stated that the wind limits for SEACOR POWER were 70 knots and the wave heights were limited to 5 feet or twice the freeboard, whichever was more conservative.[157]

[156] Exhibit 203
[157] Exhibit 59

8.7.25. The First Mate stated that SEACOR POWER could not operate in sea conditions over five feet. He stated that there were also wind limitations, but he could not remember them. He stated that if a thunderstorm was predicted to pass during a transit out of port, they would wait so that they did not get caught by a storm in restricted areas. He stated that if a warning showed a storm would pass after they departed port, then they would get underway as scheduled.

8.7.26. The Off-Boat Master stated he would never operate the vessel in 60 or 70 knot winds because he would not be able to control the boat (steer) or make any headway. He stated that five foot seas were the operating limit for the vessel. He also said that wave heights would be more restrictive than winds, because you would exceed the wave heights well before you reached the wind thresholds.

8.7.27. If the Master was concerned about the weather, he could use the company's stop work authority (SWA) to halt a transit and jack the vessel up, so that the hull was out of the water, to ride out the weather. The SMS stated that Seacor masters were expected to use their SWA if they identified a situation where it was not safe to proceed. The SMS further described SWA as an obligation to stop any situation that posed a threat to personal injury, environmental impact, and property or equipment damage. This authority was used to prevent accidents before they occurred. All company employees, regardless of their position, company, time on the job, or experience, had the power to use SWA. Seacor was required to support employees that used a SWA and could not take any disciplinary action against anyone that used a SWA. The Master or the Officer on Watch had the ultimate work authority, which meant they were the only person on board the vessel who could approve the job task to re-start after stop work authority was utilized.[158] In the past, the Master used his SWA for situations involving bad weather. He shut down SEACOR POWER in May 2020[159] and again in September 2020 due to high seas and high winds.[160]

[158] Exhibit 78
[159] Exhibit 116
[160] Exhibit 117

SEACOR MARINE

Near Miss / SWA / Unsafe Act or Unsafe Condition Form 19160

Vessel/Shore Side Department:	Seacor Power	Date:	5-8-20
Client:	Talos Energy LLC	Location:	EI 164
Operations or Activity:	Heading to location / SS224D		

Environmental Conditions – winds, seas, current, weather, visibility:

Winds ,30-35 out of the South / Seas , 5-7 Feet / Cloudy /Current 1Knot to the North / 2-3 mile visibility

Description of Near Miss / SWA / Unsafe Act or Unsafe Condition:

SWA / 0400 ,shut down vessel due to high seas and high winds .

Initial Causal Factor(s):

High Seas and winds hitting the vessel on the bow while traveling giving a whipping effect on the legs and the vessel.

Actions Taken to Prevent Re-occurrence:

Having the correct people at the wheel while traveling who can make the right decisions in bad weather and following the Masters Standing Orders and calling the Capt. when anything does not seem right.

Figure 33: Stop Work Authority form executed by SEACOR POWER Master fgon May 8, 2020 (Exhibit 116)

8.7.28. When a vessel was preparing to get underway, the Company Man said that he would let the master know when all of the equipment arrived, but he would not tell the master when to get underway. The Company Man stated that if there was bad weather, then the vessel would wait, and the Company Man would let Talos know that they were delayed.

8.7.29. The SEACOR POWER bridge watch rotation typically ran 12 hours, from 0600 to 1800, and then 1800 to 0600.[161] The Off-Boat Master stated that there were two individuals on the bridge watch at all times; a licensed officer and an A/B as a watchman.

[161] Exhibit 111

8.7.30. The Off-Boat Chief Engineer stated that there was a watch in the engine room at all times while underway. There were typically two individuals on a 12 hour watch rotation. The individual on watch conducted rounds every 30 minutes.

8.7.31. The SMS stated that Master's and Engineer's standing orders were required, and SEACOR POWER had both.[162] SEACOR POWER had standing orders for the bridge and the engine room. The Off-Boat Master stated that he and the Master shared a set of standing orders. They talked about the various reasons that the watchstander should call the Master. The Off-Boat Chief Engineer stated that the engineering standing orders discussed watch check times, how to check gauges, how to sound tanks, what to watch for and when to report items to the Chief Engineer.

8.7.32. The Operations Manual stated that the crew was required to complete a departure checklist prior to getting underway.[163] The checklist included requirements to prepare a voyage plan, assess weather conditions for the area of operation, and complete the risk assessment Job Safety Analysis (JSA) for the attended voyage. It also included preparing a cargo plan and manifest, documenting stability, and checking draft and trim and underkeel clearance for the intended voyage.[164] For each job, the departure checklist and the associated information was kept in a folder aboard the vessel.

[162] Exhibit 78
[163] Exhibit 59
[164] Exhibit 78

SEACOR MARINE

Departure Checklist 10500

Actions required by Master and/or Officer on Watch:

1	Prepare Cargo Plan and Manifest, Document Stability, and check draft, trim and under keel clearance for intended voyage as applicable. Record in Log Book.
2	Ensure all below deck cargo has been sounded prior to departure.
3	Prepare voyage plan using current charts and publications; assess weather conditions for area of operation; and complete the Risk Assessment/JSA for the intended voyage.
4	If applicable, advise Harbor Authority of ETD and of any dangerous cargo on board. Request linesmen and pilot (if applicable).
5	Ensure all crew, passengers, and offshore workers are onboard.
6	Inspect vessel for watertight integrity and securely close all ports, hatches, watertight doors, tank lids, etc.
7	Check all discharge valves are closed with caps secure, deck cargo is secured and securely stow all loose items of equipment.
8	Display appropriate flags, lights, and signals.
9	Test all vessel communication systems, whistle and navigation equipment. AIS – Update navigational status, destination and ETA, draft, and P.O.B. if changes have been made to crew. BNWAS is functioning as intended. Radar(s) and Echo Sounder is confirmed on and reading properly.
10	Test steering gear, rudder indicator, full movement of rudder, and remote steering gear control system power failure alarms, including emergency steering mode. All storage batteries and emergency lighting power systems in vessel control and machinery spaces have been tested.
11	Ensure main engines and thrusters are tested and running. Ensure standby or emergency generators are ready for use. Anchor ready for use.
12	Where any defects exist, which may affect the vessel's maneuverability, complete appropriate report confirming details to harbor by radio and forward completed report prior to departure.
13	Retrieve safe means of access (gangway).
14	Station personnel fore and aft to assist unmooring and after unmooring, secure vessel for sea. (where applicable)
15	VGP Routine Inspection ensuring deck areas are free of garbage, exposed raw materials, oil, any visible pollutant, or concern.
16	Advise when deck crew safely inside accommodation and doors secured. Closedown deck hydraulics, turn off unnecessary lighting.
17	Departing Offshore Facilities: outside the 500m zone, request confirmation from installation controller that vessel is released to go to next destination and give the ETA and any requirements on return to port. Give time of departing 500m zone and of departing location (if different). Shut off thrusters and any extra machinery started. Check course to next destination. AIS – Update destination and ETA.
18	Confirm completion of this checklist by logging in the Deck Log Book.

SMSR17 APPROVED BY: DPA EFFECTIVE DATE: 1 JAN 2020

Figure 34: Seacor Depature Checklist from SMS (Exhibit 78)

8.7.33. On April 13th, the off going duty crew started voyage planning before the oncoming crew arrived. They identified the location for the next job and created a route. After arriving on the vessel, the Master and the First Mate discussed the voyage plan and made adjustments to the route. The Master and the First Mate also discussed the weather. The First Mate stated that nothing was wrong with the vessel when they got underway.

8.7.34. The departure checklist required the crew to close all ports, hatches, watertight doors and tank lids prior to getting underway. The First Mate stated that he made an announcement as the vessel got underway telling individuals to remain inside the vessel as they were jacking down and getting underway. This was a normal practice on SEACOR POWER, and they always required individuals to remain inside while underway. The First Mate received a report from A/B 2 that said he had dogged all of the watertight doors.

8.7.35. In accordance with 46 CFR 131.310, the Master was responsible for maintaining a list with the name of each person that embarked the vessel. He was required to prepare the list before the vessel's departure and deposit the information ashore.

8.7.36. On the day of the incident, the Master sent an email to Seacor at 1508. This email stated that there were 18 people aboard SEACOR POWER (11 crew and seven offshore workers). The email provided the names of the 11 Seacor crew, but it did not provide the names of the Offshore Workers.[165]

8.7.37. SEACOR POWER had a public address system used throughout the vessel, which the crew called the Gai-tronics. The Off-Boat Master stated that this system could be used to communicate to and from the bridge. There was a station on the bridge, in the passageways, in the lounges, and out on deck near the crane pedestal.

8.7.38. The First Mate stated that he was using Follow-up steering mode on the 13th. He did not change the mode that day. That was his preferred mode of steering. The vessel could also be steered with the engines (twin screwing) where you put the starboard propellers in one direction and the port propellers in the other direction. The Off-Boat Master stated when he was twin screwing, he would typically use 50% engine speed for the reverse direction and full speed for the forward direction.

8.7.39. The First Mate stated that they would try to get to zero speed when soft-tagging so that you did not damage the connection between the pads and legs. He stated that the vessel did not roll much. He said that the typical speed was about 4 to 5 knots. He stated that the legs moved about 5 feet per minute. He said when you wanted to jack the legs up or down, you would engage the power take off (PTO) on the inboard engines in order to power the hydraulic system. There was a dead man pedal on the bridge at the operating station, underneath the wheel. The operator must be standing on the pedal to operate the jacking system. If you come off the pedal while the legs are moving, it will stop the motion. This is to keep the legs from continuing to jack if the vessel falls over and knocks the operator off station. There were leg counters on the vessel to measure the

[165] Exhibit 140

position of the legs. Whipping of the legs could be caused by certain sea conditions, and the whipping would cause the vessel to shake.

8.7.40. The Off-Boat Master stated that the vessel did not roll much. It was a heavy vessel, so if it did roll, it rolled slowly (about 3 to 4 seconds in one direction). He recalled it rolling 1.5 to 2 degrees. If there were bigger ground swells you may feel some pitching motion, but at that point you would need to jack up. It was common to have water on deck due to rolling or pitching motions. Water could get on deck from seas or swells. When you were heading into the seas, you could experience whipping of the legs in the fore and aft direction. He never saw this happen due to wind. You could not feel any change in rolling motions while the legs were jacking down. Sometimes you got a small list while jacking down, but you could control it by adjusting the leg heights. He stated that while jacking the legs down, he would never touch bottom while moving because it could damage the legs. He said the draft and trim never effected the handling. The vessel typically transited at 3.5 and maybe 5 knots in a tailwind. The fastest he ever saw the vessel move was 6 knots. He stated that at 25-30 knots of wind, the vessel would start to heel. On a long voyage it was common to have to jack up 2 or 3 times because of the weather and the fact that they were so slow. 35 to 40 knot winds would stop the forward momentum.

8.7.41. If there was bad weather, the First Mate stated that they would either soft tag or jack up until the weather passed. If they needed to jack up in an unplanned location, they would call Fugro to identify a safe jacking location. This was to ensure there were no pipelines or other obstructions in the location where they planned to jack up. If it was an emergency situation, he stated that they would soft tag and then call Fugro if they need to jack up.

8.7.42. If they received a forecast for bad weather, the Off-Boat Chief Engineer stated that they would jack up. In his experience thunderstorms are not predicted very well, and they do not receive accurate information about thunderstorms. Therefore he did not ever recall jacking up for a thunderstorm forecast. The vessel did not typically operate in water that deeper than the length of the legs. He said that he could see squall lines approaching on the radar, and he could see the squalls up to 48 miles away and 24 miles was quite common. When you lower the legs, the current will start to affect you more. The deeper you go, the more the current effects the vessel and the less impact the wind has on the vessel.

8.7.43. The Off-Boat Master stated that there were three alarms: a fire alarm, a tilt alarm and a general alarm. If the fire alarm went off for two minutes, then it would sound the general alarm. The general alarm was located on the starboard side of the bridge, on the forward, lower portion of the console. The vessel had a tilt alarm that would go off if the vessel leaned over too far. The First Mate stated that the tilt alarm was on the port side forward of the radar.

8.7.44. The Off-Boat Chief Engineer stated that there were bilge alarms in all of the machinery spaces, the bow thruster room, and the two steering compartments. He said they were tested monthly and he doesn't remember them ever going off, except for testing. The Off-

Boat Master stated the engine rooms and rudder rooms had bilge alarms, and that he never heard a bilge alarm, other than when they were being tested.

8.7.45. The Off-Boat Chief Engineer stated that there were not any alarms to indicate flooding in the legs.

8.7.46. The Off-Boat Chief Engineer stated that there were two engine rooms on either side of the vessel, with the control room in the middle. There were watertight doors on each side of the control room. If he left the engine room and went out on deck he would close the watertight door. He said the watertight doors in the engine room had indicator lights on the bridge, and those lights showed whether the doors were open or closed. The First Mate stated the same thing. There were cameras in each engine room, with display monitors on the bridge.

Figure 35: SEACOR POWER Engine Control Room (Exhibit 202)

8.7.47. The emergency lighting requirements applicable to SEACOR POWER are contained in 46 CFR Subchapter L and J, and SOLAS Chapter II-1, Part D. There was no requirement for SEACOR POWER to have a transitional source of electrical power for the lighting.

8.7.48. The Off-Boat Chief Engineer stated that there was emergency lighting in the engine room, lounge, and the galley. Vessel pictures also show emergency lights in the passageways. He said the emergency lights would stay on for about 5 to 10 minutes, but they would be dim. The Off-Boat Chief Engineer said they would check emergency lighting every hitch (every 14 days), and Master said that the emergency lighting was checked every 30 days.

8.8 Weather Conditions, Weather Reporting and Weather Equipment

8.8.1. The National Weather Service (NWS) mission is to "provide weather, water and climate data, forecasts, warnings, and impact-based decision support services for the protection of life and property and enhancement of the national economy."[166]

8.8.2. Along the Gulf Coast, the NWS has Weather Forecast Offices in Key West, Tampa, Tallahassee, Mobile, New Orleans, Lake Charles, Houston, Corpus Christi, and Brownsville. The New Orleans Baton Rouge office is located in Slidell, LA, and is managed by a meteorologist in charge. There are 20 individuals assigned to this office, and five of those individuals are designated as lead forecasters. The office also has a science and operations officer, a service hydrologist, and a warning coordination meteorologist. This office covers the region between McComb, MS (northern boundary), the Mississippi/Alabama border (eastern boundary), the Atchafalaya River (western boundary), and 60 miles offshore (southern boundary).

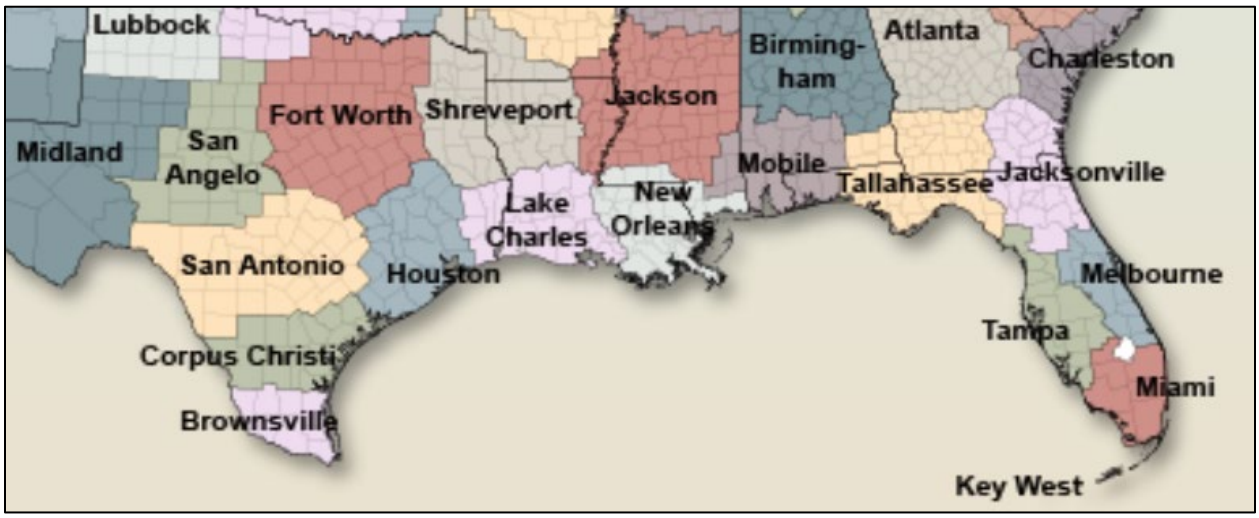


Figure 36: NWS Forecast Offices

[166] The National Weather Service (NWS), https://www.weather.gov/about/ (last visited May 11, 2022)

8.8.3. The New Orleans Baton Rouge Weather Forecast Office is a marine office, so they also produce a marine zone forecast and marine zone warnings. The following locations are designated as marine zones: Lake Borgne, Lake Pontchartrain, Lake Maurepas, Breton Sound, Chandeleur Sound, Mississippi Sound, Southwest Pass to Port Fourchon out to 20 nautical miles, Southwest Pass to Port Fourchon from 20 to 60 nautical miles offshore, Port Fourchon to Lower Atchafalaya River out to 20 nautical miles, and Port Fourchon to Lower Atchafalaya River from 20 to 60 miles offshore.

8.8.4. The NWS office has three watches each day. The first watch runs from 0000 – 0800, the second watch is 0800 – 1600, and the third watch is from 1600 – 2400. A lead forecaster is in charge of the watch, and ensures that all of the products are released in a timely and accurate fashion. This includes forecast products, warning products and climate products. On a normal weather day, two or three individuals man the watch. There are also individuals on call, and if the level of activity increases, the lead forecaster will increase the number of individuals on watch. The 0800 – 1600 watch typically has an office meeting (in person or virtually) around 0900. Then the watch will produce a Coastal Waters Forecast by 1030 and an Aviation Forecast by 1240. Then the watch produces a full forecast suite (weather, marine and fire) and an Area Forecast discussion by 1630.

8.8.5. The New Orleans Baton Rouge office produces several different types of weather products for the marine zones, including Coastal Waters Forecasts, Marine Weather Messages, Marine Weather Statements, Small Craft Advisories, Gale Warnings and Special Marine Warnings. The primary warning for mariners is the Special Marine Warning. The Lead Forecaster stated that the Special Marine Warning is the equivalent of a Severe Thunderstorm Warning over land. However, there is one difference - NWS issues Severe Thunderstorm Warnings for greater 50 knots of wind over land, but they issue Special Marine Warnings for winds in excess of 34 knots. The Special Marine Warning is a thunderstorm based warning product, which means it covers events of one to two hours in duration. For longer duration events that are not related to thunderstorm activity, the Lead Forecaster stated that he uses a Small Craft Advisory (20 to 33 knots) or a Gale Warning (over 34 knots). The Coastal Waters Forecast is a generalized five day forecast that covers the entire marine zone.

8.8.6. The NWS website states that Marine Weather Messages are used as products to cover a long duration marine watch, warning or advisory.[167] Marine Weather Statements are used to provide mariners with details regarding significant or potentially hazardous conditions that are not otherwise covered in existing marine warnings or forecasts.[168]

8.8.7. The public can obtain weather products from broadcast media, National Oceanic and Atmospheric Administration (NOAA) weather radio, the NWS website, and phone alerts

[167] Marine Weather Messages, https://www.weather.gov/marine/mwwinfo (last visited May 11, 2022)
[168] National Weather Service Glossary, https://w1.weather.gov/glossary/ (last visited May 11, 2022)

(for some products). Severe Thunderstorm Warnings are broadcast to phones using the Emergency Alert System (EAS), but Special Marine Warnings are not.

8.8.8. When the NWS sends out weather products over NOAA Weather Radio, the messages are sent to transmitters, which then send the messages out over VHF radio. The closest three transmitters to the area of the incident are located in Buras, New Orleans and Morgan City. Each site uses a different radio frequency. Since these are VHF systems, the broadcast range is limited to line of sight (roughly 25 miles offshore).

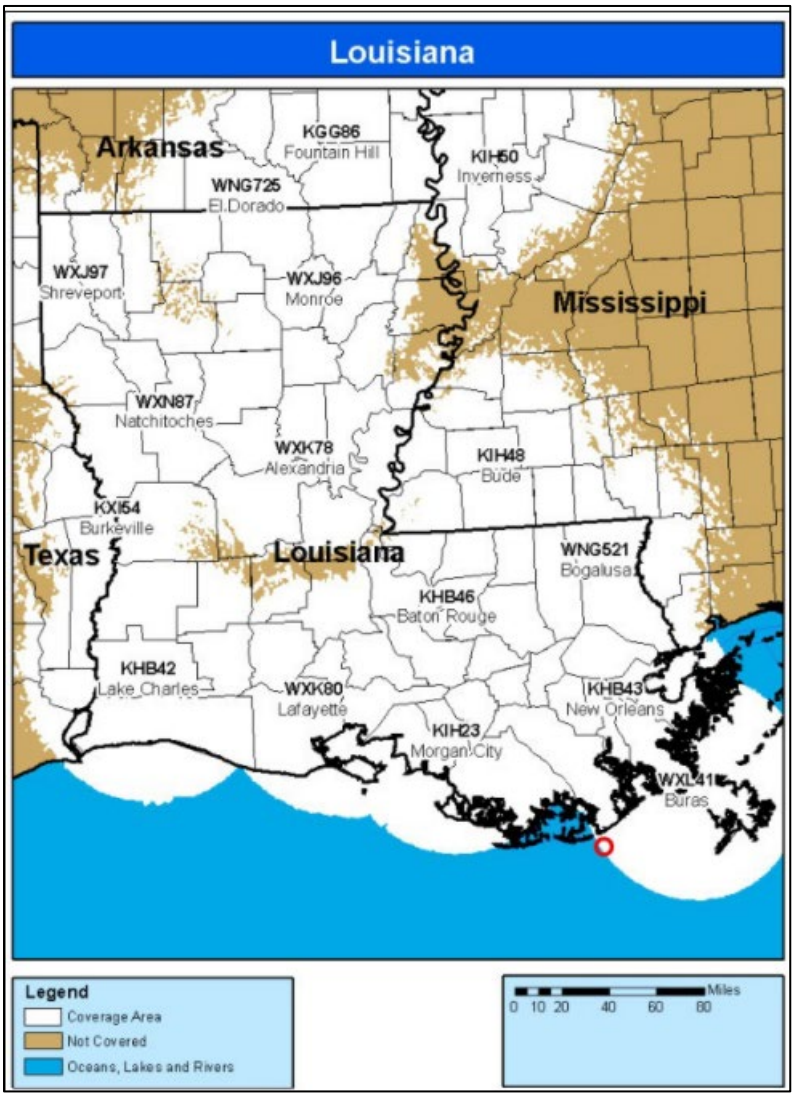


Figure 37: NWS Weather Radio coverage map

8.8.9. The First Mate stated that SEACOR POWER was not equipped with a dedicated NOAA weather radio. If the crew wanted to listen to NOAA weather broadcasts, they would change one of the VHF radios to the appropriate channel.[169]

8.8.10. The Lead Forecaster stated that he did not feel pressure from the NWS to forecast below a certain threshold. He provided forecasts that contained a reasonable, worst case scenario of expected weather conditions.

8.8.11. The Lead Forecaster stated that a wind gust is defined as a 10 second average of wind speeds.

8.8.12. The New Orleans Baton Rouge office has a Weather Service Radar (WSR) 88, which is a Doppler radar system. The WSR 88 is the main radar system used to issue weather warnings. The forecasters use the radar information to infer what is happening with the weather and create radar based warnings to share with the public.

8.8.13. At the time of the incident, the WSR 88 was located at the NWS Slidell office. The WSR 88 sent out a radar beam, but due to the location of the radar and the curvature of the Earth, the beam would only provide a picture of the atmosphere above 7,000 or 8,000 feet along the coast of Louisiana. In the marine zone off the coast, the beam would only provide a picture of the atmosphere above about 10,000 feet. As the radar beam got further away from the Slidell office, it would also spread out, which decreased the resolution of the radar and produced a less clear picture of the atmosphere. As a result, the forecasters relied on ground truth observations to validate what was seen on radar and what was placed in the weather warnings. Ground truth observations could come in from airports, weather stations, law enforcement or the public. The Lead Forecaster stated that if he did not receive ground truth observations, he relied on his training to forecast what was occurring in the area that he could not see with the radar.

8.8.14. The NWS also has access to information received by a Terminal Doppler Weather Radar that is located next to the New Orleans International Airport. The Lead Forecaster stated that the Terminal Doppler Weather Radar provides the NWS with a very good picture of what is happening over Lake Pontchartrain.

8.8.15. There is automated weather observing equipment located at the New Orleans International Airport, Baton Rouge Airport, Lakefront Airport, Slidell Airport, Gulfport Airport, Pascagoula Airport, and McComb Airport. The automated equipment sends weather observation information directly to the NWS office. The NWS also receives reports from the Galliano airport, but that information is not a constant feed and is only reported once an hour. The only other automated information in the area comes from a National Ocean Service site in Grand Isle, which comes in on an hour delay, and from the Louisiana Offshore Oil Port (LOOP), which is about 15 miles offshore.

[169] Exhibit 235

8.8.16. The Lead Forecaster stated that there used to be automated weather observing equipment in Port Fourchon, but the NWS has not received any information for several years. He said that information is sorely missed. When the Lead Forecaster started working at the New Orleans Baton Rouge office, there was also automated weather information from Terrebonne Bay, but that station stopped reporting after Hurricane Isaac.

8.8.17. The Lead Forecaster stated that the NWS also receives weather reports from the public. The public submits these reports through an online reporting system on the NWS website, or they submit them through Twitter or Facebook. The Lead Forecaster stated that the New Orleans Baton Rouge office receives very, very few weather reports from ships. He said they only come in "once in a blue moon".

8.8.18. The NWS website states that the Voluntary Observing Ship (VOS) program is designed for large ocean going vessels, and that smaller vessels cannot participate. In May 2022, the website stated there were approximately 4,000 vessels enrolled in the worldwide VOS program, and about one quarter of those were U.S. vessels. For U.S. vessels enrolled in the program, the NWS provides observing equipment and reporting supplies, and pays for communication charges, so there are no costs to the vessel.[170] The NWS website also discusses other voluntary weather reporting programs, including SKYWARN, Mariner Reports (MAREP), Mariner Observations (MAROB), Citizen Weather Observer Program (CWOP), Cooperative Observer Program (COOP) and Voluntary Mesonets. Depending on the program, there are different requirements for registration, training and equipment, and there are different methods of reporting.[171]

8.8.19. The Coast Guard and the NWS have a Memorandum of Agreement (MOA) regarding the management of marine weather information. The MOA outlines goals, coordination measures, and the responsibilities of each agency. The MOA recognizes the **U**nited States Coast Guard – **N**ational Weather Service **C**oordination-**L**iason W**o**rking **G**roup (UNCLOG) as the principal vehicle to enhance and expedite the MOA activities. The UNCLOG meets at least three times a year to develop recommendations, consider budget initiatives, configure text and graphic products, and discuss other coordination issues.[172]

8.8.20. The Coast Guard – NWS MOA states that the probability of accurate weather forecasts is enhanced by timely, consistent, and accurate observations. It also states that a common goal of the two agencies is to improve the accuracy and timeliness of marine forecasts and warnings through accurate and timely weather observations. The MOA lists another goal to eventually replace manually collected and disseminated observations with automated systems at all USCG land and ship facilities.[173]

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[170] United States Voluntary Observing Ship Program, https://www.vos noaa.gov/ (last visited May 11, 2022)
[171] Voluntary Marine Observations from Mariners, https://www.weather.gov/marine/voluntary (last visited May 11, 2022)
[172] Exhibit 248
[173] Exhibit 248

8.8.21. The NWS agrees to deliver scheduled and emergency weather products to the Coast Guard in a pre-determined format, and the Coast Guard agrees to disseminate those products through several broadcast vehicles.[174]

8.8.22. The Coast Guard agrees to participate in the NWS Voluntary Observing Ship (VOS) program, which means Coast Guard units send weather reports to the NWS when security measures and availability allowed. The NWS agrees to provide software, training and instrumentation for Coast Guard ships and coastal units actively participating in the VOS program. If non-Coast Guard ships forward VOS observations, the Coast Guard agrees to send those reports via radio to the NWS telecommunications system.[175]

8.8.23. The Coast Guard agrees to quickly inform local NWS offices of inaccurate forecasts and significant weather related events. The Coast Guard also agrees to primarily use NWS analysis and forecast products for Coast Guard field unit decision making, and the NWS agrees to provide the Coast Guard with weather information necessary for safe and successful mission accomplishment.[176]

8.8.24. The NWS agrees to broadcast Coast Guard safety and security messages, and limited public service information, via NOAA Weather Radio upon request.[177]

8.8.25. In addition to the Coast Guard – NWS MOA, the Coast Guard has several weather related Commandant Instructions. The Coast Guard's online list of directives reflects that these documents are active. The first instruction is titled Marine Weather Observation and Reporting, and was published in 1994. The second instruction is titled Coastal Weather Program, and was published in 1988. The third instruction is titled Bathythermograph Program, and was also published in 1988.[178]

8.8.26. The Marine Weather Observation and Reporting instruction states that the Coast Guard cooperates with the NWS by reporting marine weather observations. It also states that these observations are often the only marine information available to weather forecasting facilities, which makes the observations critical to accurate weather analysis and forecasting. The instruction directs large Coast Guard cutters, and specially designated small Coast Guard cutters, to report weather observations to the NWS at three hour intervals when underway within 100 miles of shore, and at six hour intervals when operating more than 100 miles from shore. Weather observations are not required to be sent when the report could compromise a law enforcement mission. The instruction directs the cutters to send their reports via radioteletype or radiotelegraph, and to log their

[174] Exhibit 248
[175] Exhibit 248
[176] Exhibit 248
[177] Exhibit 248
[178] CG-612 Directives and Publications Division, https://www.dcms.uscg mil/Our-Organization/Assistant-Commandant-for-C4IT-CG-6/The-Office-of-Information-Management-CG-61/About-CG-Directives-System/Commandant-Instructions/ (last visited May 11, 2022)

reports on a paper form. The paper forms are required to be sent to the Port Meteorological Office each month.[179]

8.8.27. The Coastal Weather Program instruction states that Coast Guard coastal stations and units are frequently the only source of weather observations in certain regions of the United States. The instruction directs all Coast Guard operational shore units to record weather observations at three hour intervals, unless the unit is specifically exempted, and to send paper observation logs to the NWS. Certain units are designated as weather reporting units, and are also required to swiftly send observations to the group commander or the district communication center via radio, teletype or telephone. The instruction lists the following District Eight Coast Guard stations as weather reporting units: Destin, FL; Pascagoula, MS; Gulfport, MS; Freeport, TX; Port O'Conner, TX; and Port Isabel, TX. In addition to scheduled observations, weather reporting units are also required to send special weather reports to NWS when wind speed doubles to 25 knots or greater, when wind increases to 34 knots or higher and gale warnings are not in effect, and when wind increases to 47 knots or higher and storm warnings are not in effect.[180]

8.8.28. The Coastal Weather Program instruction requires Coast Guard units to broadcast routine weather forecasts on a schedule, and to broadcast unscheduled NWS special weather warnings (including special marine, small craft, gale, storm and hurricane warnings) via radio immediately upon receipt.[181]

8.8.29. Both the Coast Guard Navigation Center (NAVCEN) website[182] and the National Weather Service website state that the Coast Guard broadcasts coastal weather forecasts and storm warnings on VHF channel 22A, following an initial announcement on VHF channel 16. The National Weather Service website further states that within Coast Guard District Eight, Sector Mobile, Sector New Orleans, Sector Houston-Galveston, and Sector Corpus Christi perform weather broadcasts over VHF.[183]

8.8.30. The Master of the pre-commissioned Coast Guard Cutter GLENN HARRIS stated that while he is underway he relies on VHF broadcasts to obtain marine warnings. He said most mariners are relying on VHF broadcasts, because they listen to Channel 16 all the time. He also had other equipment on GLENN HARRIS, including NAVTEX, GMDSS, INMARAT, HF and DSC. He stated that the NAVTEX was located just aft of the bridge, and was not mounted where he stood to operate the vessel. He stated that he would not see a NAVTEX message unless he left the operating station and went back to look.

8.8.31. The Coast Guard Communications Command is located in Chesapeake, Virginia. They provide long range communications capabilities for Coast Guard units, interagency

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[179] Exhibit 247
[180] Exhibit 247
[181] Exhibit 247
[182] Marine Safety Information Broadcasts, https://www.navcen.uscg.gov/?pageName=mtMsi (last visited May 11, 2022)
[183] Marine Weather Broadcasts from the USCG, https://www.weather.gov/marine/uscg_broadcasts (last visited May 11, 2022)

partners and the maritime public. They operate four additional sites in Washington, DC, Orlando, FL, Novato, CA and Kodiak, AK. There are round the clock watchstanders operating in Chesapeake and Kodiak, who stand 12 hour watches. The Communications Command also uses a remotely operated radio facility in Belle Chasse, Louisiana, and that facility is maintained by Coast Guard Base New Orleans.

8.8.32. The Communications Command distributes urgent marine safety information, navigational information, weather forecasts, and weather warnings to mariners. This information is sent using Navigational Telex (NAVTEX), which is part of the Global Maritime Distress and Safety System (GMDSS). NAVTEX transmissions are sent using medium frequency radio (518 kilohertz), which is designed to cover an area 40 to 200 nautical miles offshore, although the transmissions are also received by ships closer than 40 nautical miles from shore, and are sometimes received by ships up to 400 nautical miles offshore.

8.8.33. The NAVCEN website states that the Coast Guard only installed NAVTEX at sites that were previously used for Morse telegraphy transmissions. As a result, propagation analyses show some coverage gaps, particularly in the southeast United States, Alaska, and Guam.[184]

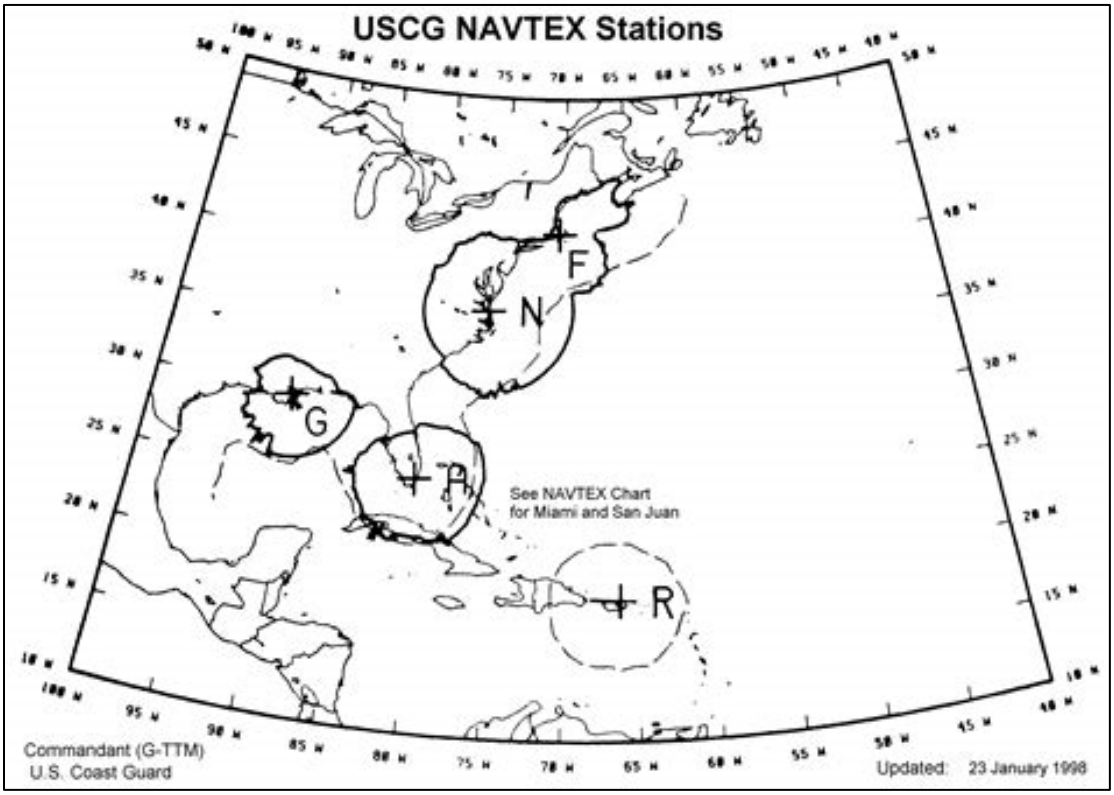


Figure 38: East Coast NAVTEX Coverage Map

[184] NAVTEX Marine Safety Broadcasts, https://www.navcen.uscg.gov/?pageName=NAVTEX (last visited May 11, 2022)

8.8.34. The radio facility in Belle Chasse, Louisiana, referred to as the New Orleans site, is used to broadcast NAVTEX messages for coastal Louisiana.

8.8.35. The NWS website states that the Coast Guard broadcasts the following products on NAVTEX: Special Marine Warnings, Marine Weather Statements, Tsunami Advisory/Watch/Warnings, Tsunami Public Messages and NAVTEX Forecasts (a combination of coastal and offshore forecasts). The Coast Guard does not broadcast Small Craft Advisories, Gale Warnings, Marine Weather Messages, or land based products, such as Thunderstorm Warnings, via NAVTEX.[185]

8.8.36. The NWS website states that the Coast Guard New Orleans NAVTEX site broadcasts Special Marine Warnings and Marine Weather Statements that are issued by the NWS Weather Forecast Offices in Tampa, Tallahassee, Mobile, New Orleans, Lake Charles, Houston, Corpus Christi, and Brownsville. The next closest NAVTEX site, in Miami, broadcasts products that are issued by the NWS Weather Forecast Offices in Tampa, Key West, Miami and Melbourne.[186]

8.8.37. The Communications Command does not receive weather messages directly from the NWS; they go through the Navy's Naval Weather Center first. The Navy receives the weather messages, processes and formats them, and then sends them to the Coast Guard using the Command and Control Office Information Exchange (C2OIX). The C2OIX system sends messages via the internet through the Department of Defense's Information Network. Once the Communications Command receives the messages, they are sent to the remote radio sites via a commercial internet service provider. At the time of the incident, the Coast Guard had a contract with Verizon to provide this service. When the digital signal arrives at the remote radio site, it is automatically converted to an analog format and sent out via radio. Ships receive these messages through a narrow band medium frequency receiver (NAVTEX receiver), which has printers or scrollable screens to view the information.

8.8.38. The Communications Command sends six scheduled broadcasts per day to each location. These broadcasts are sent automatically, and do not require action from the watchstander. Two of the broadcasts are for notices to mariners, and the other four broadcasts are for routine weather forecasts. A scheduled broadcast lasts four to 10 minutes. At the time of the incident, the New Orleans station (in Belle Chasse) was scheduled to send messages at 0000, 0400, 0800, 1200, 1600 and 2000.

8.8.39. The Communications Command also sends out urgent information on an unscheduled basis, including special marine warnings. These types of messages require intervention from the watchstander. When a special marine warning is received at the Communications Command, the watchstander receives a visible and audible alert. Each message is tagged to indicate which region it covers. The watchstander reviews the message to identify the region, and then checks the applicable radio site to see if the

[185] NAVTEX Product Listing, https://www.weather.gov/marine/navprod (last visited May 11, 2022)
[186] *Id.*

system is in the middle of a scheduled broadcast. If the system is broadcasting, the watchstander interrupts the transmission and sends out the special marine warning. If the system is not broadcasting, the watchstander sends the warning immediately.

8.8.40. Each watchstander at the Communications Command conducts a quality assurance check for each site once per watch. The watchstander does not receive a notification if a message does not properly transmit, but they do receive warnings if the remotely operated radio site is not working properly or if the internet signal is not working.

8.8.41. On April 7, 2021, the Communications Command sent out a message to let the public know that the remotely operated radio site in New Orleans was experiencing a degradation in services. This message was sent as a precaution because one of the site's transmitters was not working properly, but the remaining four transmitters were still operational and could still send messages. The Commanding Officer of the Communications Command stated that the site still sent out the required messages while the one transmitter was down. The transmitter issue was corrected on April 18th.

8.8.42. On April 13, 2021, at 0702, the Seacor Dispatcher emailed a weather forecast to SEACOR POWER. The weather forecast predicted "moderate choppy seas" for the morning of April 13, with east-southeast winds from 10-14 knots. The forecast also predicted "light SE winds with a slight chop" and "winds SE 9 to 12 knots" for the afternoon. The Seacor Dispatcher obtained the forecast from Buoy Weather, using a geographic location of 28°55.245'N, 089°59.071'W.[187]

8.8.43. The Coast Guard District Eight Command Center Command Duty Officer (CDO) stated that his watch team discussed the weather forecast that morning, and they expected some storms in the afternoon, but nothing out of the ordinary. The Sector Command Center CDO stated that he saw an email from the NWS that morning, and the email stated that there was a slight risk of severe weather in the afternoon. The Sector CDO did not remember receiving any other NWS warnings that day. The Station Grand Isle Operations Petty Officer stated that she used a NOAA application on her phone to check the weather, and that day the weather forecast for Grand Isle predicted 25 knot winds and three to five foot seas.

8.8.44. On April 13th, the New Orleans Baton Rouge NWS office was adhering to COVID protocols, and no more than five individuals were allowed in the office at any given time. At 0745, the oncoming Lead Forecaster received a briefing from the off going shift. The off going shift said that the risk of severe weather for the area had increased from a marginal risk (level 1 of 5) to a slight risk (level 2 of 5). The warning area included the coastal waters south of New Orleans and west of the Mississippi River. The Lead Forecaster stated that when he arrived for his watch, all of the equipment was working properly. The Lead Forecaster had worked at the Slidell Forecast Office as a General

[187] Exhibit 138

Forecaster from August 2004 to January 2021. In January 2021 he became a Lead Forecaster.

8.8.45. At 0800, the Communications Command sent a scheduled NAVTEX broadcast that included a meteorological forecast for the Gulf of Mexico, weather statements for Brownsville and Corpus Christi, TX, and a couple of navigational warnings. At approximately 1000, the watchstander at the Communications Command noticed an issue with the internet connectivity between the site in Chesapeake, VA and the remotely operated radio site in New Orleans (Belle Chasse), LA. The watchstander manually tried to send out a NWS weather forecast to test the internet connectivity, but the watchstander could not confirm that the message was sent. The watchstander requested technical assistance from Coast Guard Base New Orleans and Verizon to repair the system. The Communications Command could not send scheduled or unscheduled NAVTEX broadcasts until the system was restored. There were no alternative methods to send NAVTEX messages while the internet was down. The Commanding Officer of the Communications Command stated that these types of outages were very rare, and he only observed this type of issue once a year.

8.8.46. At 0846, the Seacor Operations Manager spoke with the Master of SEACOR POWER. During the call they discussed the weather for the mid-point of the vessel's planned trackline. The forecast for that area was three to four foot seas and 15 to 20 knot winds.

8.8.47. On April 13th, two additional personnel were working in the New Orleans Baton Rouge NWS office that day, the Service Hydrologist and the Science and Operations Officer. These individuals supplemented the watch. At the 0900 meeting, the Lead Forecaster said that he would work the radar that day. A general forecaster was assigned to produce the forecast package, and the Science and Operations Officer (SOO) was assigned to serve as a meso analyst, watching the atmosphere for new areas of development. The service hydrologist was assigned to produce the river flood warnings.

8.8.48. The NWS's slight risk (level 2 of 5) of severe weather was associated with a boundary that extended from Baton Rouge, down through the Metropolitan New Orleans area, and then to the mouth of the Mississippi River. Dry and stable air was located to the north and east of the boundary. Very warm and moist air was located to the south and west of the boundary, which produced conditions that were conducive for thunderstorm development. The lead forecaster stated that the primary weather concern that morning was hail. The office received a number of reports of hail from the public that morning. Around 1130 or 1200 the event transitioned to more of a wind event. The office received a report of wind damage in Tangipahoa Parish.

8.8.49. The Lead Forecaster stated that a bow echo (an area of very strong winds on the leading edge of a thunderstorm) started to form around that time. The bow echo formed from a thunderstorm on the northern side of Baton Rouge. There were two areas of low pressure associated with the bow echo – one to the north and one to the south. The bow echo (stronger winds) followed the boundary line into the western portion of Saint Tammany Parish. As the bow echo moved, the low pressure to the south weakened, but the low pressure to the north remained strong.

8.8.50. At 1205, the NWS's Storm Prediction Center in Norman, Oklahoma issued Severe Thunderstorm Watch Number 94. This watch pertained to portions of Southeast Louisiana and Coastal Waters. The latitudes and longitudes cited in the watch identified that the watch pertained to an area that covered from 40 miles northwest of New Orleans to 55 miles southwest of Boothville. The primary threats included scattered damaging wind gusts to 70 mph and scattered large hail events. [188] The NWS website stated that the Coast Guard broadcasted Special Marine Warnings and Marine Weather Statements on NAVTEX, but land based weather products, such as Thunderstorm Watches, were not on the list of products that the Coast Guard broadcasted via NAVTEX.[189]

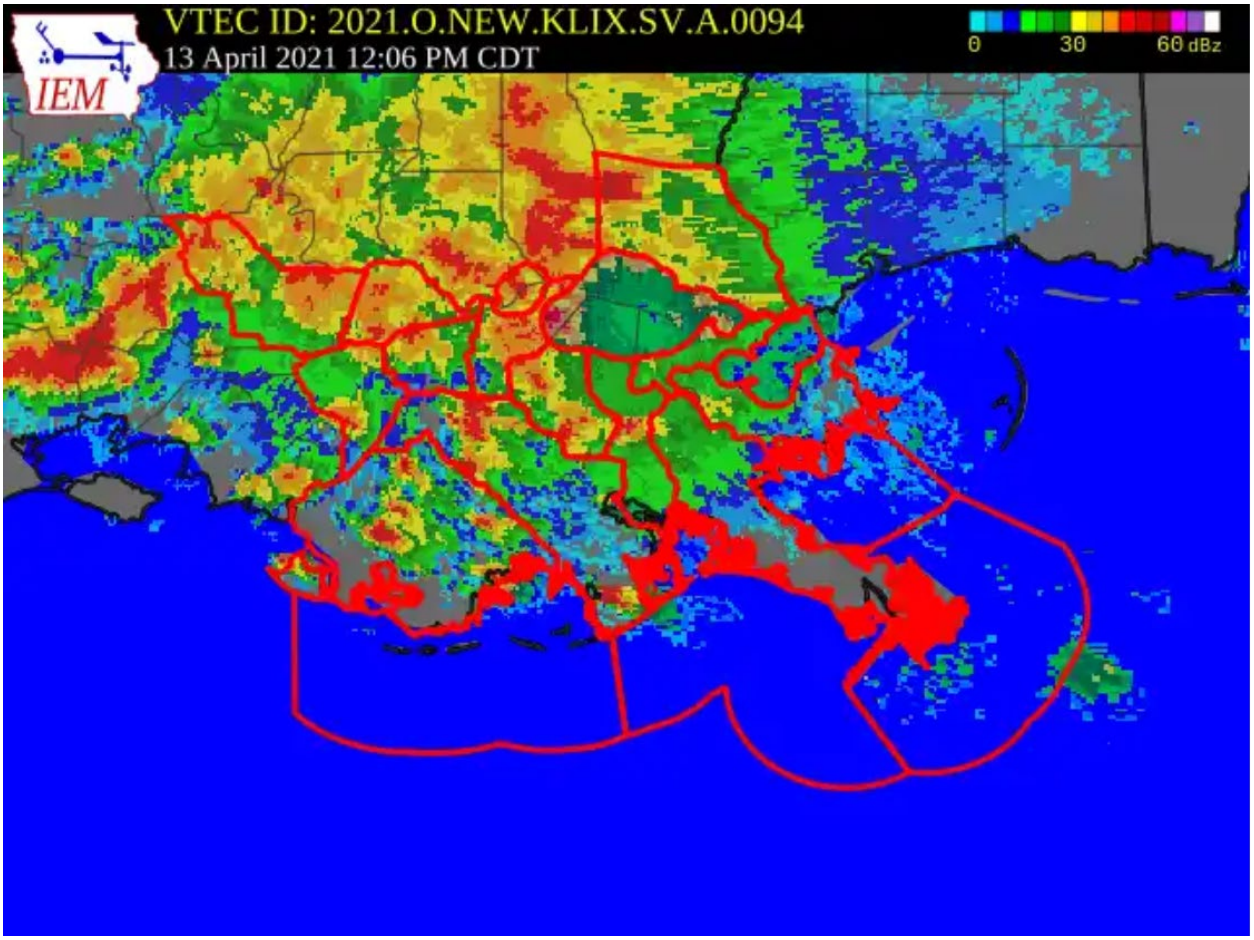


Figure 39: Warning Zone for Severe Thunderstorm Watch #94

8.8.51. At 1208, the NWS in New Orleans issued a Special Marine Warning for coastal waters, from Southwest Pass to the Atchafalaya River, out to 20 nautical miles. This warning noted a severe thunderstorm located eight nautical miles northwest of Grand Isle, moving

[188] Exhibit 249
[189] NAVTEX Product Listing, https://www.weather.gov/marine/navprod (last visited May 11, 2022)

northeast at 20 knots, and impacting Barataria Bay (northeast of Port Fourchon). This did not apply to SEACOR POWER's location or planned trackline. The hazards included wind gusts of 34 knots or greater and large hail. The NWS detected the storm by radar at 1207.[190] The lead forecaster stated that this storm eventually weakened and moved out of the area.

8.8.52. Around 1210, the Master and the First Mate met in the Master's office. The two discussed the weather report that was provided by Seacor that morning. The First Mate recalled that the weather report predicted 2-4 foot seas and 10-15 knot winds. At 1217 the First Mate got SEACOR POWER underway from Bollinger Dock in Port Fourchon. The First Mate stated that he did not check any other sources for a weather forecast that day, and he did not receive any additional forecasts that day.

8.8.53. At 1223, the NWS issued a Special Marine Warning for Lake Pontchartrain and Lake Maurepas (north of Port Fourchon). This warning noted a strong thunderstorm near Mandeville (north of Lake Pontchartrain), moving southeast at 30 knots. This did not apply to SEACOR POWER's location or planned trackline. The hazard associated with this storm was wind gusts to 40 knots.[191]

8.8.54. The Lead Forecaster stated that the 1208 and 1223 special marine warnings were issued for individualized thunderstorms which were not impacting offshore areas of Louisiana.

8.8.55. The Master of the pre-commissioned Coast Guard Cutter GLENN HARRIS monitored the weather forecast that morning using the Weather Channel Application and the Wind Finder Application on his phone. He arrived on the vessel around 1230. When the rest of the crew arrived, they held a pre-underway safety briefing which included a weather discussion. He knew a line of storms was scheduled to move through the area that day, and he was expecting 35 knot winds with 3 to 5 foot seas. The Master and the crew decided to leave Port Fourchon, proceed to their training location, wait for the storms to pass, and then continue their training. The Master stated that the GLENN HARRIS operating parameters were 70 knot winds and 25 foot seas.

8.8.56. Between 1230 and the time of the SEACOR POWER capsizing, the NWS recorded a very high number of lightning strikes in New Orleans and the surrounding areas.

8.8.57. The Lead Forecaster stated that the low pressure area associated with the bow echo began moving south, and started to move across Lake Pontchartrain. The Lead Forecaster stated that as the low pressure area moved over the lake, he observed ducting (a situation where the stronger winds from higher elevations began to move down toward the surface). As the low pressure area moved south, it strengthened and produced a line of strong thunderstorms. This line of thunderstorms continued to move south.

[190] Exhibit 200
[191] Exhibit 200

8.8.58. At 1234, the Houma-Terrebonne Airport recorded a wind from 170° at four knots, with gusts to 16 knots. The sensor was 10 feet above the ground. At 1248, the airport recorded a wind from 040° at 26 knots, with gusts to 43 knots.[192]

8.8.59. At 1329, the NWS issued another Special Marine Warning for Lake Pontchartrain and Lake Maurepas (north of Port Fourchon). This warning noted strong thunderstorms extending from Lake Pontchartrain/Lake Maurepas to 14 nautical miles southwest of Kenner (north-northwest of Port Fourchon), and moving southeast at 10 knots. This did not apply to SEACOR POWER's location or planned trackline. The hazard associated with this line of storms was wind gusts 34 knots or greater.[193]

8.8.60. The Lead Forecaster stated that the low pressure area stopped moving around 1400, when it was located near the West Bank in New Orleans. The low wrapped in drier air from the north and a river flow jet from the south, then it started accelerating to the south. A wake low (a broad, midlevel area of low pressure that forms behind a strong convective system) formed behind the bow echo. The Lead Forecaster stated that he typically saw two to three wake lows form in the area each year. He said that the wake low on April 13th was very unusual, because it was much stronger and lasted much longer than other wake lows. He also said that the wake low and the bow echo combined that day to create a very severe line of thunderstorms that pushed south across Port Fourchon and into the Gulf of Mexico.

8.8.61. At 1400, the USCGC MORAY was moored at Coast Guard Station Grand Isle, LA. The vessel's crew recorded nine knot winds coming from the west.[194]

8.8.62. At 1427, the NWS issued a Special Marine Warning for Breton Sound, and for coastal waters, from Southwest Pass to Port Fourchon, out to 20 nautical miles. This warning noted a severe thunderstorm was located 9 nautical miles northwest of Barataria Bay (northeast of Port Fourchon), moving east at 15 knots, and impacting Barataria Bay. This did not apply to SEACOR POWER's location or planned trackline. The hazards included wind gusts of 34 knots or greater and large hail.[195] The Lead Forecaster stated that this warning was associated with the line of thunderstorms that was moving south. The warning pertained to the edge of the storm, which was actually moving to the east when the warning was issued. The western part of the storm was not as strong and did not warrant a warning at that time.

[192] Exhibit 250
[193] Exhibit 200
[194] Exhibit 242
[195] Exhibit 200

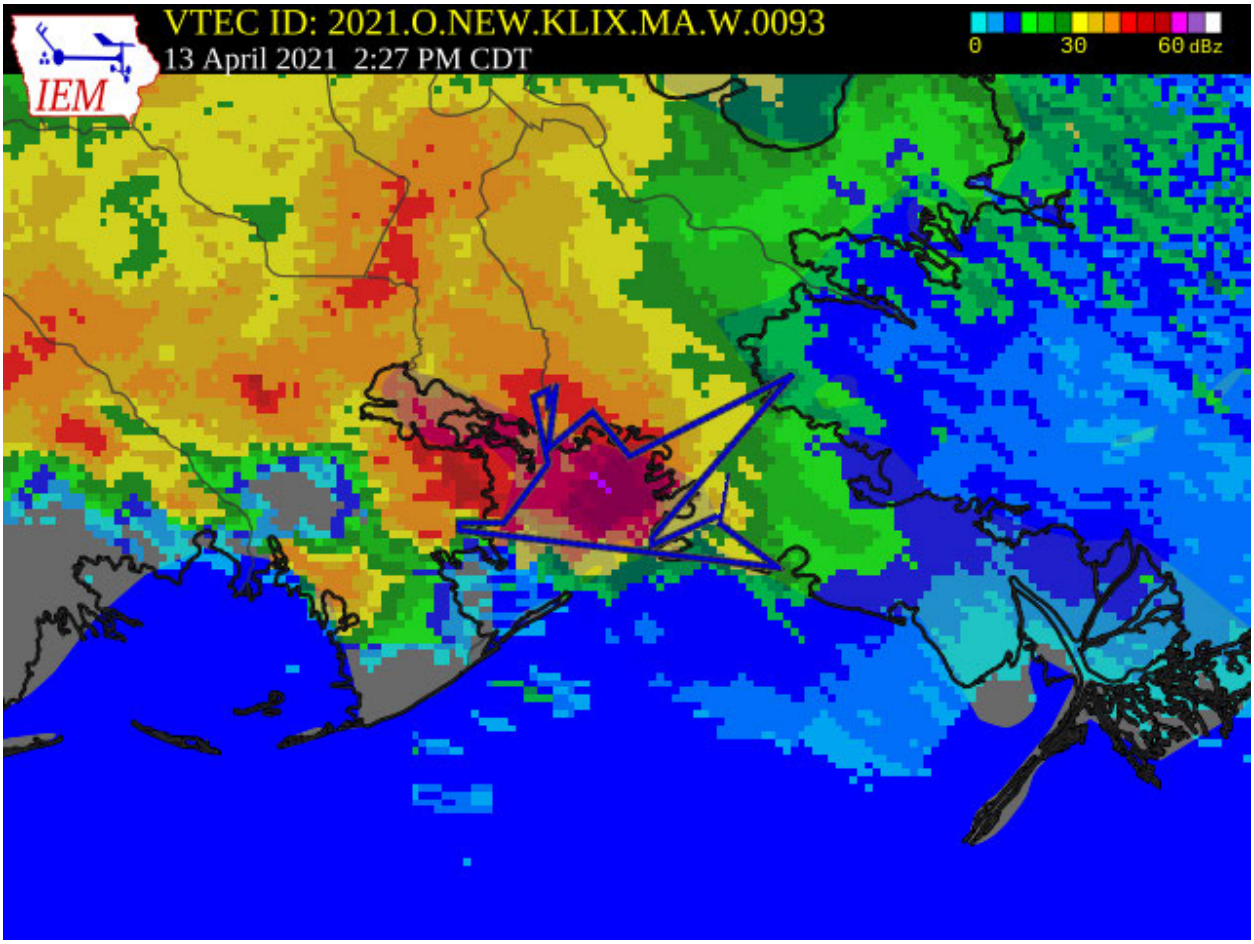


Figure 40: Applicable zone for and radar image Special Marine Warning issued at 1427 on April 13, 2021 (not for SEACOR POWER's location or intended location)

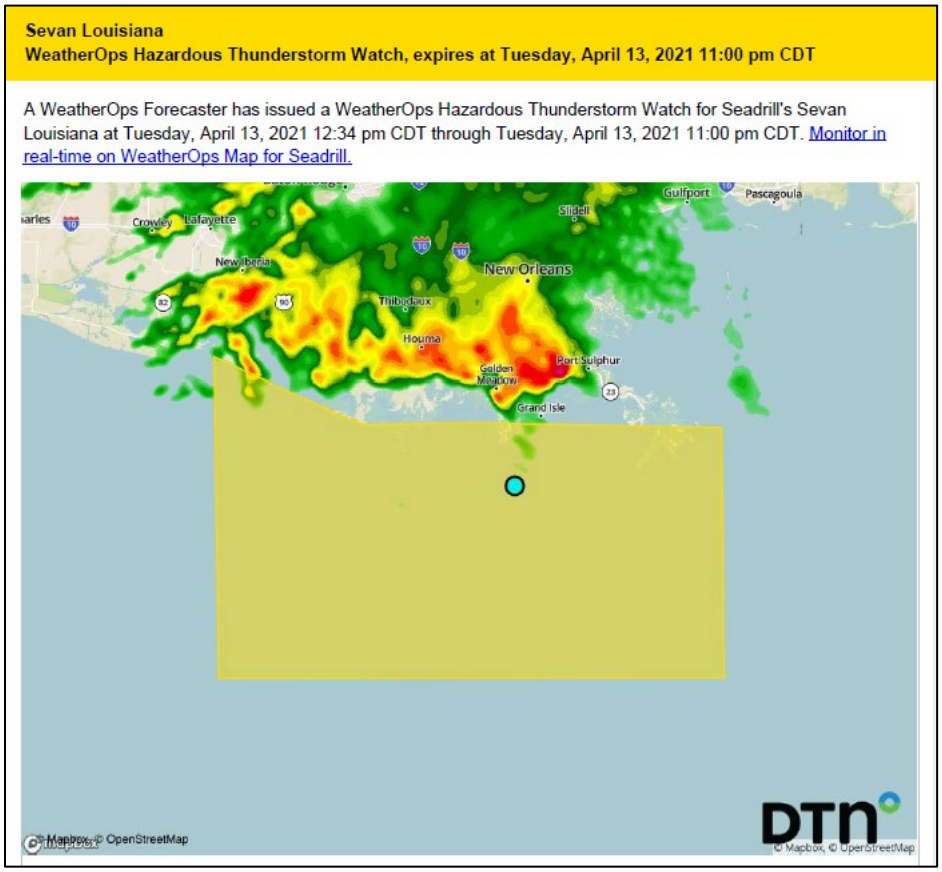
[196] The Lead Forecaster recalled seeing an automated weather report showing the 43 knot wind gust from Galliano.

8.8.64. At 1441, the Liftboat ROCKFISH arrived at the Sugar Dog Platform (approximately 7 nautical miles south of Port Fourchon).[197] The ROCKFISH Master observed 15-20 mile an hour winds, 1.5 knots of current moving to the east, and 3 to 5 foot seas.

8.8.65. The semi-submersible offshore drilling rig SEVAN LOUISIANA was located 8.5 nautical miles south-southeast of ROCKFISH. The operator of SEVAN LOUISIANA had a contract with a commercial weather service provider named DTN. At 1442, a DTN forecaster emailed a Hazardous Thunderstorm Watch for the SEVAN LOUISIANA's

[196] Exhibit 16
[197] Exhibit 124

location. The watch predicted wind gusts of 60+ knots, hail, heavy rain and frequent lightning, and it was valid until 2300. At 1508, a DTN forecaster emailed a Hazardous Thunderstorm Warning for the vessel's location. The warning predicted wind gusts in excess of 50 knots, hail, heavy rain and frequent lightning, and it was valid until 1705.[198]



8.8.66. Liftboat VANESSA was located 4.7 nautical miles west of ROCKFISH,[199] in South Timbalier Block 21. A consultant for Cox Operating LLC was aboard VANESSA.[200] Cox Operating LLC had a contract with StormGeo, a commercial weather service provider. As part of that contract, StormGeo provided weather forecasts and weather alerts for certain locations. At 1453, StormGeo issued a storm weather alert for Ship Shoal Block 169, located 45 nautical miles southwest of VANESSA, and South Marsh Island Block 217, located 97 nautical miles west-northwest of VANESSA. This alert predicted a cluster of strong to severe thunderstorms moving offshore within 1-2 hours. The alert also predicted northerly wind gusts as high as 70-80 knots, large hail, frequent lightning, and torrential downpours.[201]

[198] Exhibit 251
[199] Exhibit 124
[200] Exhibit 252
[201] Exhibit 253

StormGeo

Severe Weather Alert Status Update
For: {Cox Operating LLC} SM-217 SS-169

Condition Orange

Severe Thunderstorms
Issued: 2:53 PM CDT Tue, Apr 13, 2021.
Valid: 04:00 PM CDT Tue to 08:00 PM CDT Tue

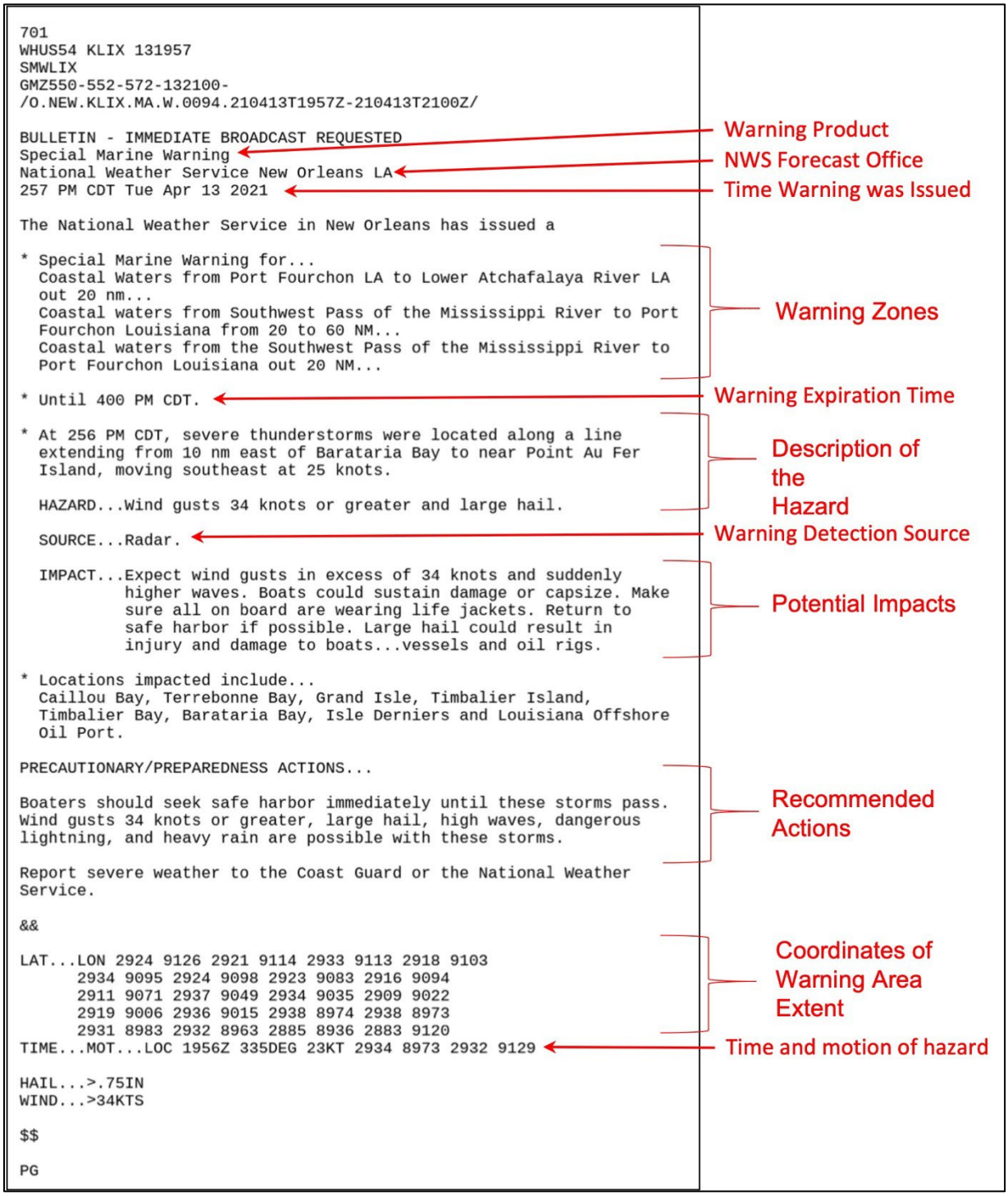
Lightning	Frequent
Hail	Up to 1 1/2 inches in diameter
Tornadoes	Isolated
Wind	Gusts to 80 kts

Discussion:

A cluster of strong to severe thunderstorms over southern Louisiana will begin to move offshore within the next 1-2 hours. As these storms move southward, they will produce northerly wind gusts as high as 70-80 knots, large hail, and frequent lightning, as well as torrential downpours.

8.8.67. At 1457, the NWS issued a Special Marine Warning for coastal waters, from Southwest Pass to the Atchafalaya River, out to 20 nautical miles. This warning also extended out to 60 nautical miles between Southwest Pass and Port Fourchon. This warning impacted Caillou Bay, Terrebone Bay, Grand Isle, Timbalier Island and Timbalier Bay, Barataria Bay, Isle Derniers, and LOOP. The impacted areas included SEACOR POWER's location and planned trackline. This warning noted severe thunderstorms extending from 10 nautical miles east of Barataria Bay to Point Au Fer Island (west-northwest of Port Fourchon), and moving southeast at 25 knots. The hazards included wind gusts of 34 knots or greater and large hail.[202]

[202] Exhibit 200


701
WHUS54 KLIX 131957
SMWLIX
GMZ550-552-572-132100-
/O.NEW.KLIX.MA.W.0094.210413T1957Z-210413T2100Z/
BULLETIN - IMMEDIATE BROADCAST REQUESTED
Special Marine Warning
National Weather Service New Orleans LA
257 PM CDT Tue Apr 13 2021
The National Weather Service in New Orleans has issued a
* Special Marine Warning for...
Coastal Waters from Port Fourchon LA to Lower Atchafalaya River LA out 20 nm...
Coastal waters from Southwest Pass of the Mississippi River to Port Fourchon Louisiana from 20 to 60 NM...
Coastal waters from the Southwest Pass of the Mississippi River to Port Fourchon Louisiana out 20 NM...
* Until 400 PM CDT.
* At 256 PM CDT, severe thunderstorms were located along a line extending from 10 nm east of Barataria Bay to near Point Au Fer Island, moving southeast at 25 knots.
HAZARD...Wind gusts 34 knots or greater and large hail.
SOURCE...Radar.
IMPACT...Expect wind gusts in excess of 34 knots and suddenly higher waves. Boats could sustain damage or capsize. Make sure all on board are wearing life jackets. Return to safe harbor if possible. Large hail could result in injury and damage to boats...vessels and oil rigs.
* Locations impacted include...
Caillou Bay, Terrebonne Bay, Grand Isle, Timbalier Island, Timbalier Bay, Barataria Bay, Isle Derniers and Louisiana Offshore Oil Port.
PRECAUTIONARY/PREPAREDNESS ACTIONS...
Boaters should seek safe harbor immediately until these storms pass. Wind gusts 34 knots or greater, large hail, high waves, dangerous lightning, and heavy rain are possible with these storms.
Report severe weather to the Coast Guard or the National Weather Service.
&&
LAT...LON 2924 9126 2921 9114 2933 9113 2918 9103
2934 9095 2924 9098 2923 9083 2916 9094
2911 9071 2937 9049 2934 9035 2909 9022
2919 9006 2936 9015 2938 8974 2938 8973
2931 8983 2932 8963 2885 8936 2883 9120
TIME...MOT...LOC 1956Z 335DEG 23KT 2934 8973 2932 9129
HAIL...>.75IN
WIND...>34KTS
$$
PG
Warning Product
NWS Forecast Office
Time Warning was Issued
Warning Zones
Warning Expiration Time
Description of the Hazard
Warning Detection Source
Potential Impacts
Recommended Actions
Coordinates of Warning Area Extent
Time and motion of hazard

8.8.68. At 1507 the Master sent an email to Seacor with his evening operations report. The report listed the weather as cloudy skies with southeast winds 15-20 miles per hour, 3-4 foot seas, and 3-4 miles of visibility.[203]

8.8.69. At 1516, the C-Port Drydock West camera, located on the Floatation Canal on the northern edge Port Fourchon, recorded the arrival of a rain squall. The winds came from a westerly direction. This was the first of two squalls to hit.[204]

8.8.70. At 1519, SEACOR POWER encountered a rain squall. The First Mate observed that the wind quickly jumped up to 79 mph and then slowed to 30 – 40 mph. These winds came from the stern of the vessel (from the north). Between 1519 and 1529, SEACOR POWER's speed increased from 2.5 knots to 5.5 knots. At 1529, the speed steadied at 5.5 knots.[205] The First Mate did not increase the vessel's engine speed during this period.

8.8.71. At 1521, C-Port Drydock West camera recorded the arrival of a second, stronger squall. The winds associated with this squall came from the north.[206] The HOS Port North Yard camera, just to the west of the C-Port Drydock, also recorded the arrival of the second squall. One minute after the second squall arrived, the HOS camera recorded a 229 ft. boom of a 110 ton Terex HC 110 crane on the dock rotating 90 degrees, from East to South, due to the wind speed. The camera showed zero visibility at the peak of the squall, and recorded intense winds for 108 minutes, or 1 hour and 48 minutes.[207] At 1522, the second squall reached the camera at the Baroid Dock in Bayou Lafourche, 1.5 miles south of the C-Port Drydock. The squall was moving south, toward SEACOR POWER.[208]

8.8.72. The Coast Guard Station Grand Isle Operations Petty Officer stated that heavy weather passed over Station Grand Isle. She said that the rain and lightning were really bad, there were very heavy winds, and water was coming up and over the seawall at the Station. The winds snapped some of the lines on one of the Station's 24 foot boats. The Training Petty Officer had been at Station Grand Isle for four years, and had never seen weather that bad, even during one hurricane when he remained at the Station. He had never seen lines snap on any of the Station boats. The USCGC MORAY was tied up in Grand Isle at the time, and their crew saw 90 mile per hour winds.

8.8.73. At 1530, the ROCKFISH Master observed wind speeds of 30 to 35 mph that increased to 95 mph.

8.8.74. At 1532, SEACOR POWER encountered the second squall. The First Mate observed white-out conditions, and the visibility reduced from 5-6 miles down to approximately

[203] Exhibit 140
[204] Exhibit 274
[205] Exhibit 45
[206] Exhibit 274
[207] Exhibit 112
[208] Exhibit 187

100 feet (about the length of the vessel). Between 1532 and 1534 the vessel's speed increased from 6 to 8.5 knots.[209]

8.8.75. At 1533, the NWS issued a Coastal Waters Forecast for the area from Pascagoula, MS to the Atchafalaya River, out to 60 nautical miles. For SEACOR POWER's location, the forecast stated that Severe Thunderstorm Watch 94 was in effect. The evening forecast predicted southeast winds 20 to 25 knots, and seas 3 to 6 feet, with occasional 8-foot seas.[210]

8.8.76. At 1537, SEACOR POWER capsized to starboard.

8.8.77. At 1537, the Liftboat VANESSA Master observed a wind speed of 103 mph. He said that the weather conditions decreased dramatically and almost without warning. Approximately 3 minutes later he observed a 113 mph wind gust.[211] The vessel was located 3.9 nautical miles west-northwest of SEACOR POWER.[212]

8.8.78. At 1538, Offshore Supply Vessel CHRISTIAN CHOUEST observed a 71-knot wind gust from 005° and sustained winds of 55 knots.[213] The vessel was located 4.6 miles west-southwest of SEACOR POWER.[214]

8.8.79. At 1558, the NWS issued a Special Marine Warning for coastal waters, from Southwest Pass to the Atchafalaya River, out to 60 nautical miles. This warning noted strong thunderstorms extending from 10 nautical miles southeast of Barataria Bay, to seven nautical miles northwest of LOOP, to nine nautical miles east of Eugene Island 105, moving south at 30 knots, and impacting the LOOP. This warning noted that the line of thunderstorms had already moved to the south of SEACOR POWER's location. The hazard associated with this line of storms was wind gusts 34 knots or greater.[215]

[209] Exhibit 45
[210] Exhibit 226
[211] Exhibit 252
[212] Exhibit 124
[213] Exhibit 135
[214] Exhibit 124
[215] Exhibit 200

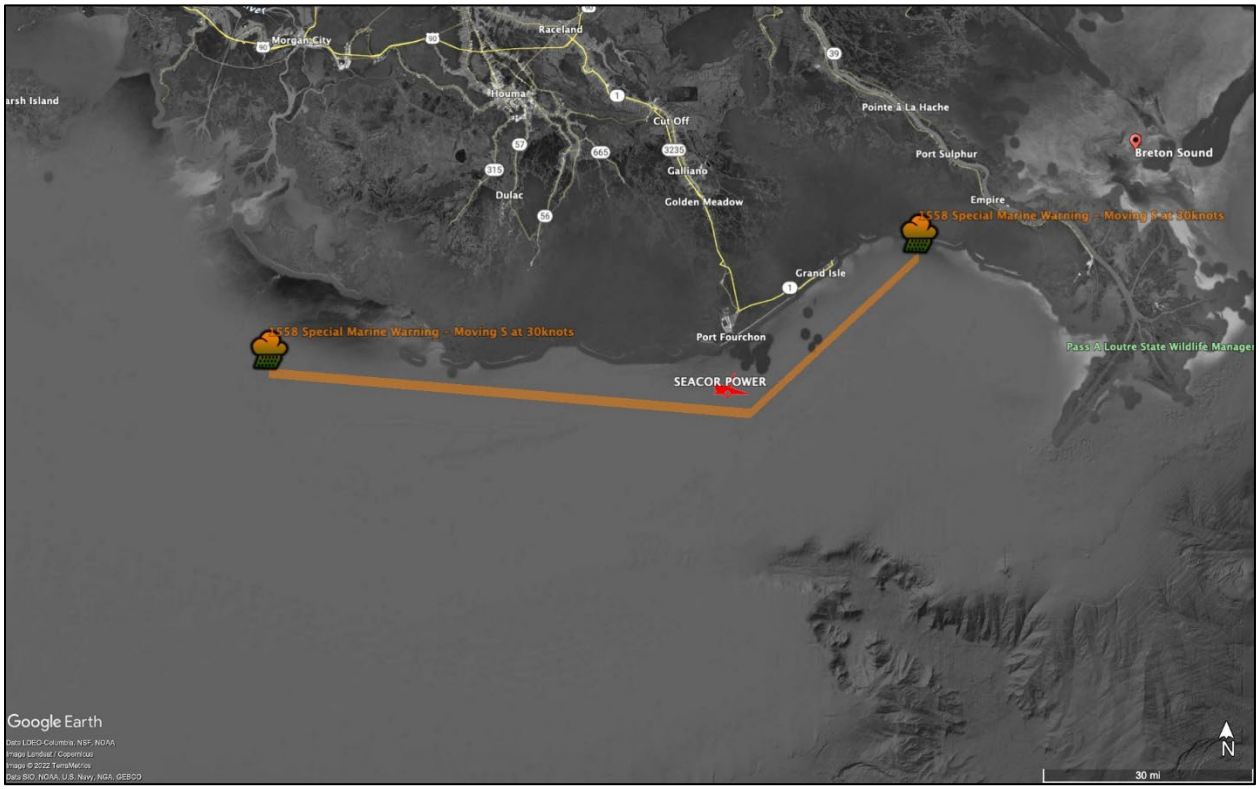


Figure 44: Plotted line of thunderstorms from NWS Special Marine Warning at 1558 showing the line south of SEACOR POWER

8.8.80. The Lead Forecaster stated that the Science and Operations Officer was monitoring Facebook and other reports from the public. The Lead Forecaster stated that he did not see any public weather reports pertaining to areas south of Lake Pontchartrain during his watch, which ended at 1600.

8.8.81. At 1600, the USCGC MORAY was moored at Coast Guard Station Grand Isle, LA. The vessel's crew recorded 75 knot winds coming from the north.[216] At the same time, Offshore Supply Vessel CHRISTIAN CHOUEST observed visibility less than ¼ mile and 75 knot wind gusts at their location, 4.6 miles west-southwest of SEACOR POWER. Between 1600 and 1621 the CHRISTIAN CHOUEST recorded a wind gust of 98 knots.[217] Around this time, the Master of the pre-commissioned Coast Guard Cutter GLENN HARRIS observed the winds jump from 10 to 15 knots, up to 80 knot winds, within a matter of one to two minutes. The winds remained at 80 knots for 15 to 20 minutes. The visibility reduced to a few hundred feet. The cutter was located 11 nautical miles northeast of SEACOR POWER. The Master of GLENN HARRIS stated that he did not hear any special marine warnings broadcast on VHF that day.

[216] Exhibit 242
[217] Exhibit 7

8.8.82. During the hearing the Master of Liftboat ROCKFISH reported that his anemometer measured a wind gust of 112mph on the date of the incident. The Master did not know what time this gust occurred, but provided a photo of the anemometer reading.[218]

8.8.83. The Louisiana Offshore Oil Port (LOOP) was located approximately 11 nautical miles southeast of the SEACOR POWER capsizing site. The LOOP observed the following winds at a height of 190 feet above sea level[219]:

Time	Direction	Average (5 min)	Max 1 second reading (5 min)
15:30	156°	29	34
15:35	158°	33	36
15:40	163°	34	38
15:45	165°	35	40
15:50	258°	39	51
15:55	332°	32	66
16:00	353°	31	66
16:05	345°	66	90
16:10	327°	57	94
16:15	349°	64	81
16:20	353°	69	86
16:25	355°	76	88
16:30	018°	64	79
16:35	011°	54	72
16:40	021°	50	75
16:45	024°	47	60
16:50	017°	47	62
16:55	024°	42	52

8.8.84. At 1621, Offshore Supply Vessel CHRISTIAN CHOUEST observed visibility improving to 400 meters, and sustained winds from 040° at speeds greater than 45 knots. The vessel was located 4.6 miles west-southwest of SEACOR POWER.[220]

[218] Exhibit 144
[219] Exhibit 18
[220] Exhibit 135

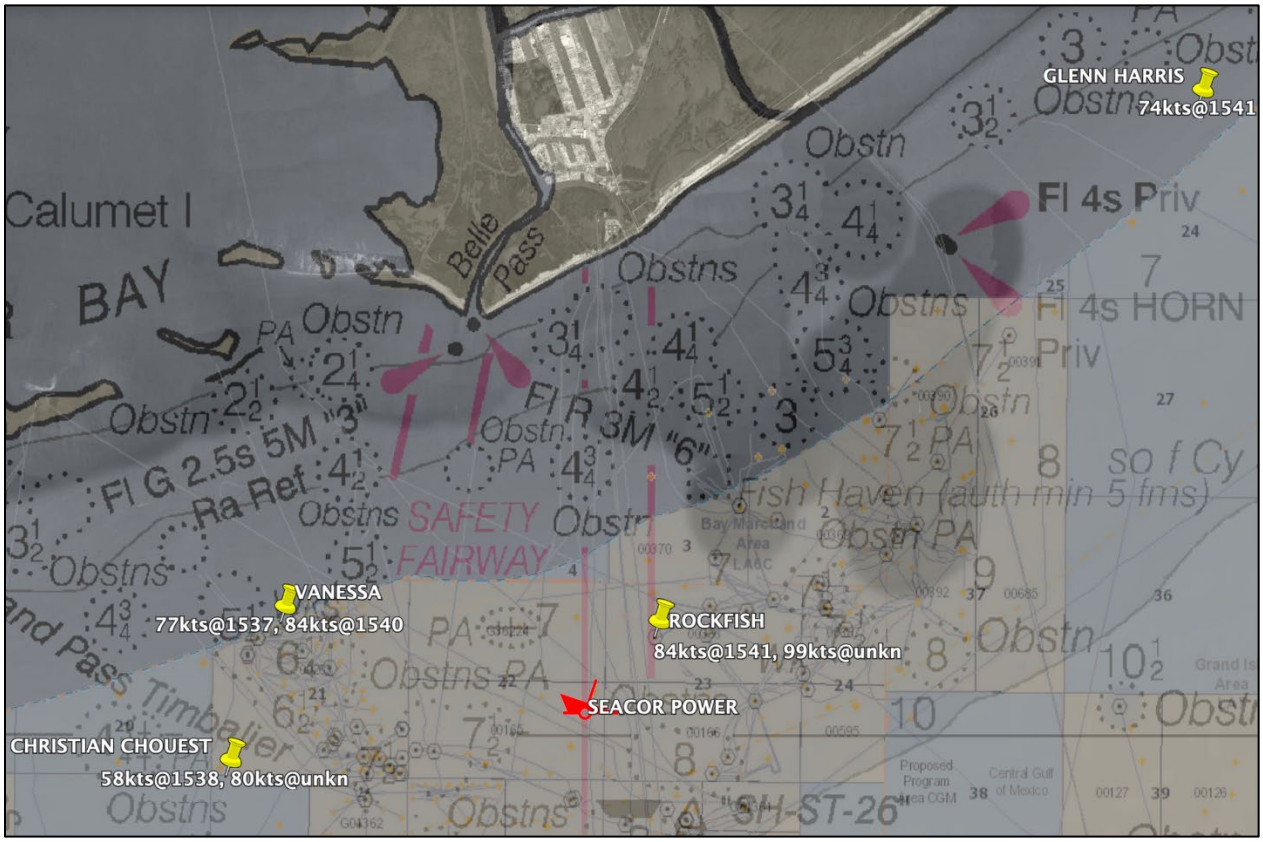


Figure 45: Wind speed observations near the capsize time, normalized to a 33 foot height above sealevel

8.8.85. At 1623, the internet connection between the Communications Command in Chesapeake, VA and the remotely operated radio site in New Orleans (Belle Chasse), LA was restored.

8.8.86. At 1630, the NWS issued a Special Marine Warning for coastal waters, from Southwest Pass to Port Fourchon, out to 60 nautical miles. This warning noted severe thunderstorms extending from 13 nautical miles northwest of Southwest Pass, to 30 nautical miles southwest of Pilottown, to 15 nautical miles southeast of the LOOP, moving southeast at 40 knots, and impacting Southwest Pass. The impacted areas were offshore of SEACOR POWER's location. The hazards included waterspouts, wind gusts in excess of 50 knots, frequent lightning, and large hail.[221]

8.8.87. At 1642, the NWS issued a Special Marine Warning for coastal waters, from Southwest Pass to the Atchafalaya River, out to 20 nautical miles. This warning also extended out to 60 nautical miles between Southwest Pass and Port Fourchon. This warning impacted the bays and nearshore waters for Caillou Bay, Terrebone Bay, Grand Isle, Timbalier Island and Timbalier Bay, Barataria Bay, Isle Derniers, and the Louisiana Offshore Oil Port (LOOP). The impacted areas included SEACOR POWER's location. This warning

[221] Exhibit 200

noted strong winds (34 to 50 knots) behind a gust front that extended from six nautical miles east of Barataria Bay, to eight nautical miles southeast of Timbalier Bay, to nine nautical miles south of Point Au Fer Island. The NWS obtained the information to generate this warning from buoy data.[222]

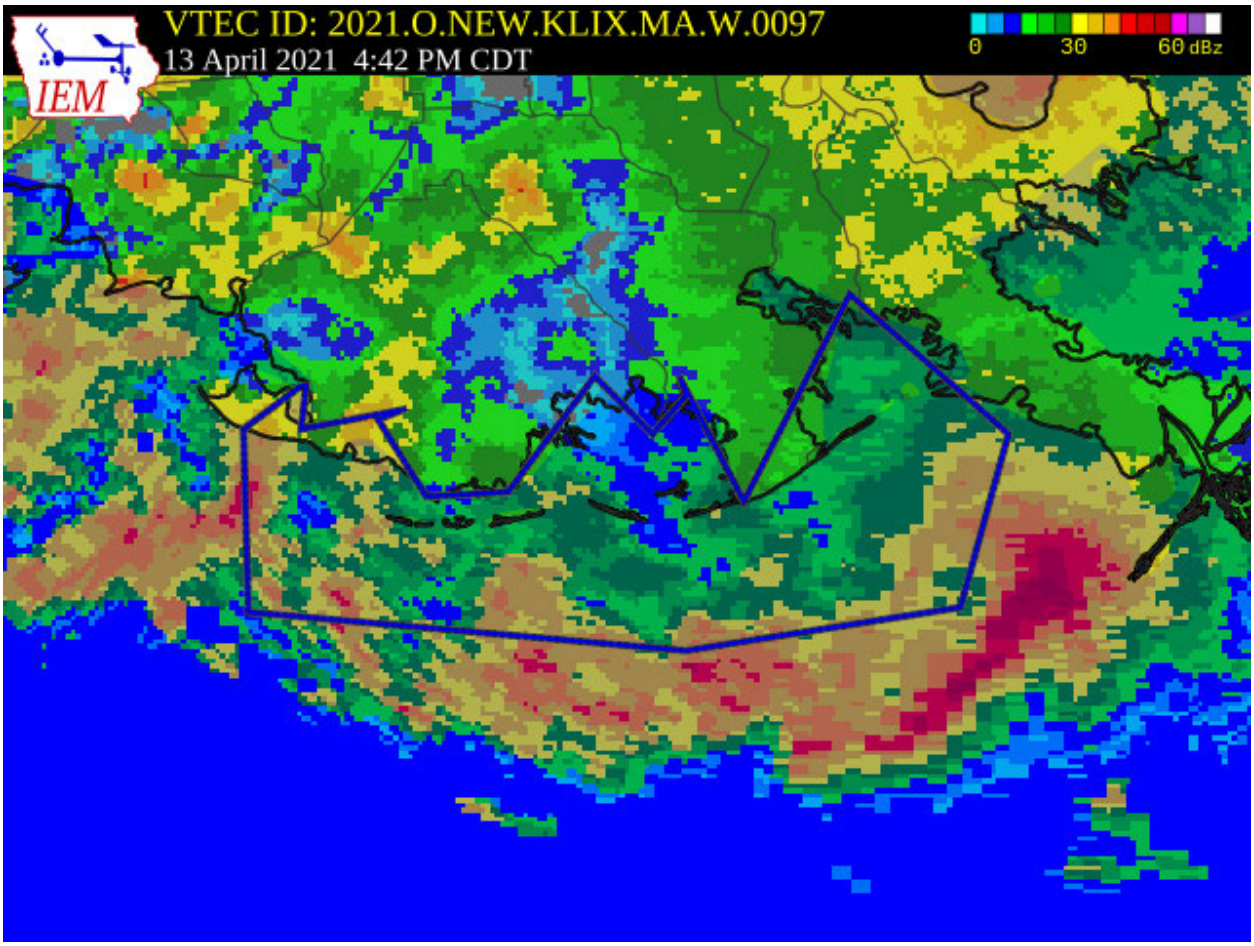


Figure 46: Applicable zone and radar image for Special Marine Warning issued at 1642 on April 13, 2021

8.8.88. Between 1700 and 1855, the LOOP recorded five minute maximum wind speeds between 37 and 55 knots. The five minute average wind speeds for this same period were between 31 and 46 knots.[223]

8.8.89. At 1705, the NSW issued a Special Marine Warning for coastal waters, from Southwest Pass to the Atchafalaya River, out to 60 nautical miles. This warning noted strong thunderstorms extending from 22 nautical miles south of the LOOP, to 45 nautical miles south of Dulac, to near Ship Shoal 198, moving south at 10 knots. This did not apply to

[222] Exhibit 200
[223] Exhibit 18

SEACOR POWER's location. The hazard associated with this line of storms was wind gusts to nearly 50 knots.[224]

8.8.90. At 1758, the NWS issued a Special Marine Warning for Breton Sound, Chandeleur Sound, Lake Borgne, Lake Pontchartrain, and Lake Maurepas. These locations were inland and this warning did not apply to SEACOR POWER's location.[225]

8.8.91. At 1801, the NWS issued a Special Marine Warning for coastal waters, from Southwest Pass to the Atchafalaya River, from 20 to 60 nautical miles offshore. This did not apply to SEACOR POWER's location.[226]

8.8.92. At 1807, the NWS issued a Special Marine Warning for coastal waters, from Pascagoula, MS to Port Fourchon, out to 20 nautical miles. The impacted areas included SEACOR POWER's location. This warning noted strong winds behind a front were occurring across the sounds from Biloxi westward and down to the coastal waters near Southwest pass. The hazard was noted as wind gusts 34 knots or greater.[227]

8.8.93. At 1812, the NWS issued a Special Marine Warning for coastal waters, from Southwest Pass to the Atchafalaya River, out to 60 nautical miles. This warning impacted Caillou Bay, Terrebone Bay, Grand Isle, Timbalier Island and Timbalier Bay, Barataria Bay, Southwest Pass, Isle Derniers, and the Louisiana Offshore Oil Port (LOOP). The impacted areas included SEACOR POWER's location. This warning noted strong winds behind a front were persisting across most coastal waters and offshore for over 40 miles. The hazard was noted as wind gusts 34 knots or greater.[228]

8.8.94. At 1832, the NWS issued a Marine Weather Statement for coastal waters, from Southwest Pass to the Lower Atchafalaya River, from 20 to 60 nautical miles offshore. This did not apply to SEACOR POWER's location.[229]

8.8.95. At approximately 1845, two Coast Guard Station Grand Isle Response Boats arrived on scene with SEACOR POWER. The coxswains observed 40 to 60 knots of wind, and 10 to 12 foot seas, with occasional 15 foot seas.

8.8.96. At 2000, the Communications Command successfully sent a scheduled NAVTEX broadcast with 9 different messages.

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[224] Exhibit 200
[225] *Id.*
[226] *Id.*
[227] *Id.*
[228] *Id.*
[229] Exhibit 20

8.8.97. At 2400, the crew of Offshore Supply Vessel CAPE COD recorded the weather at the location of the capsized SEACOR POWER. They observed rain, winds 40-50 knots, seas 10-12 feet, visibility 6-8 miles.[230]

8.8.98. The Liftboat VANESSA Master stated that he had worked offshore in the Gulf of Mexico for more than 16 years, and he stated that the weather on April 13th was one of the worst weather conditions he had ever seen.[231]

8.8.99. The GLENN HARRIS Master stated that he had worked on ships in the Gulf of Mexico for 36 years, and during that time he had never seen a storm of this strength and duration. He said that if he had known there would be 80 knot winds, or even 50 knot winds, he would not have gotten underway that day.

8.8.100. The NWS Lead Forecaster stated that the wake low that occurred on April 13th was the strongest wake low he had ever seen in his 17-years at the Slidell Office.

[230] Exhibit 2
[231] Exhibit 252

8.9 Lifesaving and Distress Signaling Equipment

8.9.1. The table below shows the type and quantity of lifesaving equipment that was required on SEACOR POWER, along with the domestic and international regulations that established those requirements. After the Coast Guard inspection and ABS surveys conducted on February 11, 2021, SEACOR POWER was in compliance with all of the requirements outlined in the table.

Type of Lifesaving Equipment	Quantity	U.S. Regulations	International Regs
Lifeboats*	0	N/A	SOLAS, Ch III, Reg 31. P 1
Lifeboat Portable Radios	3	47 CFR 80.1085	SOLAS, Ch III, Reg 6, P 2.1
Inflatable Liferafts**	6	46 CFR 133.105	SOLAS, Ch III, Reg 31, P 1.3
Rescue Boat	1	46 CFR 133.135	SOLAS Ch III, Reg 31, P 2
SARTs	2	47 CFR 80.1095	SOLAS, Ch III, Reg 6, P 2.2
Lifejackets (adult only)	66	46 CFR 133.70 (b)	SOLAS, Ch III, Reg 7, P 2
Ring Buoys Total With Lights Lines Attached	 8 4 2	46 CFR 133.70 (a)	SOLAS, Ch III, Reg 7, P 1 SOLAS, Ch III, Reg 32, P 1
Immersion Suits***	0	46 CFR 133.70 (c)	SOLAS, Ch III, Reg 7, P 3 SOLAS, Ch III, Reg 32, P 3
EPIRB	1	46 CFR 133.60 47 CFR 80.1085	SOLAS, Ch IV/7.6
GMDSS Equipment	-	46 CFR 130.210 47 CFR Part 80 Subpart W	SOLAS, Ch IV

* Vessel was not required to carry lifeboats, because the length of the vessel was < 85 meters.
** Vessel had six inflatable liferafts on board, with a total capacity of 150 persons.
*** Immersion Suits were not required in warm waters between 32° N and 32° S latitudes.

Table 4: Lifesaving equipment requirements for SEACOR POWER

8.9.2. SEACOR POWER's inflatable liferafts were stored on the main deck, aft of the forward legs and around amidships. There were three on each side, and the total capacity of all six liferafts was 150. All of the liferafts were up to date on their life raft servicing.[232]

[232] Exhibit 83

Figure 47: Liferafts stowed on SEACOR POWER (Exhibit 202)

8.9.3. During the capsizing, the three liferafts on the port side remained in their racks. The crew did not manually release these port side liferafts, and the rafts were not submerged, so they were not automatically deployed by the hydrostatic release. They remained up and out of the water, and they were still secured on the vessel, in their cradles, the morning after the incident. One of the liferafts on the starboard side released and was observed next to the boat on the morning of April 14th.

8.9.4. The other two liferafts on the starboard side automatically released and floated away from the vessel, and they were both found on April 14th. No individuals were found in either liferaft. [233]

8.9.5. SEACOR POWER's rescue boat was stored on the main deck, port side, near the stern. The rescue boat was davit launched.[234] After the capsizing, the rescue boat was found, upside down, in the vicinity of Raccoon Point.[235]

8.9.6. A Search and Rescue Transponder (SART) is a device used for locating survival craft. When a radar SART is activated and detected, a distinct signal should appear on the

[233] Exhibit 23
[234] Exhibit 202
[235] Exhibit 23

screen of nearby ships or aircraft carrying X-band radars. The range is about 10 nautical miles on the surface of the water, and about 40 nautical miles in the air. SARTs are not intended for distress alerting devices, but rather as distress locating devices. There are also AIS-SARTs, which can be detected on a ship's Automatic Identification System (AIS).

8.9.7. There were two radar SARTs stored on SEACOR POWER's bridge, located on the aft side of the port and starboard wheelhouse doors.[236] The SARTs were manufactured by Jotron.[237] The First Mate stated that the SARTs were recently replaced. He also stated that there were no SART poles on SEACOR POWER.

Figure 48: SART stowage location in wheelhouse

8.9.8. After SEACOR POWER capsized, the First Mate climbed through the door to the portside of the wheelhouse and then reached back through the door to grab the SART from its wall mount near the door. Throughout his time in the water, the First Mate held the SART above the water. He held onto the SART's antenna (narrow end) and had the body (wide end) on top. He saw the SART's indicator/activation light illuminated. The GLENN HARRIS Master stated that he did not see any SART signals on the day of the incident. None of the Good Samaritans or Coast Guard members that responded to the SEACOR POWER incident stated that they saw a SART signal on the day of the incident.

8.9.9. The NTSB coordinated post-casualty testing of the SART that the First Mate had with him in the water. During the first on water test, the SART was not detected by any of the participating boats, which included two Coast Guard 29 foot boats and a Fire Boat. The NTSB sent the SART to the manufacturer, who conducted both a bench test and an on

[236] Exhibit 202
[237] Exhibit 154

water test. The SART performed correctly during both tests. After the SART was returned, the NTSB conducted additional on water testing. The SART was not displayed on the Coast Guard 29 foot boat radar when the crew used their normal radar settings. The SART was only displayed on the radar after the crew adjusted the radar range and gain.[238]

8.9.10. The First Mate stated that there were lifejackets stored on SEACOR POWER's bridge. The Off-Boat Master said that the vessel had lifejackets stored in each stateroom. He also stated that the vessel had two boxes of lifejackets at the muster station, which was on the main deck. These two boxes were in addition to the required complement of lifejackets. The extra boxes were not for use while underway; they were tied up and secured on the 01 level of the house while the vessel was underway.

8.9.11. A picture of the extra lifejacket boxes, taken on February 17, 2021, showed that each box held 10 lifejackets.

Figure 49: Extra lifejacket boxes (Exhibit 202)

8.9.12. In addition to the vessel's complement of lifejackets, many of the survivors stated that they carried their own personal work vests (typically a type III or type V personal

[238] Exhibit 272

flotation device). The Company Man stated that he carried his own personal flotation device.

8.9.13. Due to SEACOR POWER's operating area, the vessel was not required to carry immersion suits. This exception is found in 46 CFR 133.70(c), which stated that OSVs operating in the Gulf of Mexico, or on other routes between 32 degrees north latitude and 32 degrees south latitude, did not need to carry immersion suits.

8.9.14. Global Maritime Distress Safety System (GMDSS) is the umbrella of internationally approved distress telecommunications systems. The primary purpose is to allow a vessel to alert other ships in the area, and shore side personnel, that the vessel is in distress. The system is designed to allow a vessel to make notifications through at least two independent methods for each area of operation. GMDSS also allows a vessel to receive emergency signals. GMDSS includes INMARSAT and 406 MHz EPIRBs for satellite distress alerting, Digital Selective Calling (DSC) for sending terrestrial digital distress alerts, and MF/HF and VHF radios for distress alerting using voice channels.

8.9.15. INMARSAT stand for International Maritime Satellite. INMARSAT provides emergency calling capability to ships using a worldwide network of maritime mobile satellite communications.[239] INMARSAT is also used to disseminate marine safety information via satellite, and that service is called SafetyNET. SafetyNET divides the world into 21 separate areas, and ships can receive navigational and meteorological warnings for their operating area. The Gulf of Mexico and the Western half of the Atlantic Ocean fall into Area IV. Ships can receive all of the messages addressed to an area if the crew enters the area number into the ship's INMARSAT terminal. If the INMARSAT terminal is connected to the ship's GPS, or if the crew manually enters the ship's position, then the ship will only receive messages that apply to their location.[240]

8.9.16. SEACOR POWER had an INMARSAT-C system on the bridge and could receive SafetyNET navigational and meteorological warnings over that system. The INMARSAT system was on SEACOR POWER's GMDSS console, on the aft bulkhead of the port side of the bridge.

8.9.17. In accordance with Title 46 Code of Federal Regulations (CFR) 133.60, SEACOR POWER was carrying a Category 1, 406 MHz satellite Emergency Position-Indicating Radio Beacon (EPIRB) that met the requirements of 47 CFR part 80. This EPIRB was a device that could be automatically or manually activated to transmit a distress signal to a satellite. The distress signal was sent over 406 MHz, a frequency designated solely for satellite distress beacons. SEACOR POWER's EPIRB was stowed in a float-free

[239] GMDSS Frequently Asked Questions, https://www.navcen.uscg.gov/?pageName=gmdssFaq (last visited May 2022)

[240] MARCOMS – INMARSAT C SafetyNet, https://www.navcen.uscg.gov/?pageName=gmdssSafteyNet (last visited May 2022)

bracket, set for automatic activation, and mounted in a manner so it would float free if the vessel sank.

8.9.18. 47 CFR 80.1061 requires all EPIRBs to be registered with NOAA before installation and requires registration information to be kept up-to-date. This also requires vessel owners to advise NOAA of any change in vessel or EPIRB ownership, any EPIRB transfer to another vessel, or any other change in registration information. The NOAA website offers online registration and online updates.

8.9.19. SEACOR POWER's EPIRB was properly registered, and the registration database contained the address for SEACOR POWER's owner, along with the vessel's length, type, and capacity. The point of contact for the vessel was listed as Seacor's 24-hour dispatch, and the registration information contained the cellular phone number for the Seacor Dispatcher. There were no other phone numbers included in the database. The registration information was last updated in November 2020.[241]

8.9.20. Beginning in 1998, some 406 MHz EPIRBs were built with an internal GPS navigation device. These EPIRBs can send accurate location information to rescue authorities immediately after activation of the beacon.[242] SEACOR POWER's EPIRB did not have an internal GPS navigation device.

8.9.21. 47 CFR 80.1061 requires all EPIRBs to be built to the technical and performance standards contained in RTCM 11000. These standards contain a number of design characteristics, and the currently accepted version includes standards for position data to be encoded into the beacon message (through an internal navigation device). As of January 17, 2020, EPIRBs that did not meet the requirements of RTCM 11000 were prohibited from being manufactured, imported, or sold in the United States. The regulations also state that beginning on January 17, 2023, vessels subject to 47 CFR Subpart R, S, or W are prohibited from operating EPIRBs that do not meet the requirements of RTCM 11000.

8.9.22. EPIRBs are detected by the COSPAS-SARSAT system, which is made up of a number of satellite constellations. COSPAS is a Russian acronym that stands for Space System for Search of Distress Vessels. SARSAT is an acronym that stands for Search and Rescue Satellite-Assisted Tracking.[243]

8.9.23. At the time of the incident, there were three types of satellites in the SARSAT system – Low-Earth Orbiting Search and Rescue (LEOSAR) satellites; Geostationary Orbiting

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[241] Exhibit 225

[242] Emergency Position-Indicating Radio Beacon (EPIRB), https://www navcen.uscg.gov/?pageName=mtEpirb (last visited May 2022)

[243] Emergency Position-Indicating Radio Beacon (EPIRB), https://www navcen.uscg.gov/?pageName=mtEpirb (last visited May 2022)

Search and Rescue (GEOSAR) Satellites; and Medium Earth Orbiting Search and Rescue (MEOSAR) Satellites. LEOSAR satellites monitor Earth's weather, environment, and climate, but can also detect and locate activated 406 MHz distress beacons. LEOs are close to the Earth, so they have a limited field of view, and there are a small number of number of satellites in this constellation. As a results, LEOs do not provide continuous coverage. They have to fly over an activated distress beacon to pick up the signal, and then have to be in view of a ground station to transmit the signal. It takes at least three beacon bursts to calculate a position estimate for a beacon. GEOSAR satellites are further from the Earth and hover continuously over a fixed spot, so they can immediately detect activated distress beacons. Since GEOs are not moving, though, they cannot determine a beacon location unless the beacon has an internal GPS. MEOSARs are a new addition to the SARSAT system, and the satellites are arranged to ensure that no less than four SAR equipped satellites are visible from anywhere on Earth at any time. MEOs provide near instantaneous global detection of distress beacons, and can calculate beacon locations after as little as one beacon signal burst.[244] At the time of the incident, Coast Guard policy stated that if a LEOSAR and a MEOSAR provided conflicting distress beacon locations prior to position confirmation, then the LEOSAR position was given priority.[245]

8.9.24. Personal Locator Beacons (PLBs) are similar to EPIRBs, but they are designed to be carried by an individual person. They can be used by individuals traveling to remote location in the wilderness, or by individuals on ships. Emergency Locator Transmitters (ELTs) are beacons designed for use in an aircraft. PLBs and ELTs are required to be registered with NOAA.[246]

8.9.25. According to NOAA's website, around the time of the incident, 98% of all EPIRB, ELT, and PLB beacon activations were false alerts. False alerts can be caused by accidental activation of a beacon, improper testing, or incorrect decommissioning or disposal of an old beacon.[247]

8.9.26. As discussed in Section 8.8 above, Navigational Telex (NAVTEX) is also part of GMDSS. Similar to SafetyNET, NAVTEX is also used to distribute urgent marine safety information, navigational information, weather forecasts, and weather warnings to mariners. However, NAVTEX information is not sent via satellite; it is sent using medium frequency radio (518 kilohertz). SEACOR POWER had a NAVTEX receiver on the port side of the bridge.

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[244] Search and Rescue Satellites, https://www.sarsat noaa.gov/search-and-rescue-satellites/ (last visited May 2022)

[245] Exhibit 243

[246] 406 MHz Emergency Distress Beacons, https://www.sarsat.noaa.gov/emergency-406-beacons/#elt (last visited May 2022)

[247] Preventing False Alerts, https://www.sarsat noaa.gov/preventing-false-alerts/ (last visited May 2022)

8.9.27. SEACOR POWER had one Medium Frequency (MF)/High Frequency (HF) radio on the GMDSS console, which was located on the aft bulkhead of the bridge, port side. The vessel also had two VHF radios; one on the console near the starboard side of the operating station, and one on the GMDSS console.

8.9.28. Digital Selective Calling (DSC) is similar to an electronic paging system, and it can be used to provide distress alert information over maritime radio (HF, MF, or VHF). DSC allows a crewmember to press a button on the radio and instantly send a pre-formatted distress alert message. Both of SEACOR POWER's VHF radios had DSC, and the MF/HF radio had DSC capabilities as well.

8.9.29. SEACOR POWER's GMDSS console had two distress buttons on the console, one attached to the MF/HF radio and one attached to the INMARSAT. The First Mate stated that he pressed a GMDSS alert button after the vessel capsized.

8.9.30. Seacor's Safety Management System did not prohibit the use or carriage of knives aboard their vessels. The Talos HSE Manager said that Talos had a policy stating that their employees could not use a knife, but they did not specifically say you could not carry a knife.

8.10 Search and Rescue

8.10.1. One of the Coast Guard's statutory missions is Search and Rescue. The Coast Guard publishes policy, guidelines, procedures and general information regarding Search and Rescue (SAR) operations in the SAR Addendum. There were a number of different Coast Guard units involved in search and rescue actions for SEACOR POWER, including District Eight and Sector New Orleans, along with multiple Air Stations, Cutters, and Small Boat Stations.

8.10.2. The Coast Guard District Eight office is located in New Orleans, LA. The District Eight Area of Responsibility covers all or part of 26 states in the middle of the U.S., stretching along the Gulf Coast from Brownsville, Texas to Carrabelle, Florida, up to North Dakota, west to Colorado and portions of Wyoming, and east to portions of Pennsylvania and all of West Virginia. There are seven different Sectors located within District Eight.

8.10.3. One of the primary functions of the District Eight Command Center is to serve as a Rescue Coordination Center (RCC). A RCC is a facility with the responsibility to promote efficient organization of SAR services and to coordinate the conduct of SAR operations within a search and rescue region. The District Eight Command Center provides oversight and support to the Sectors, and manages all of the aviation and ship assets that are not controlled by the Sectors. The District Command Center has computers and phones to run their operations. They also have High Frequency radios to talk directly with Coast Guard aircraft and cutters, but they do not have VHF radios.

8.10.4. At the time of the incident, there were typically three people on watch in the District Eight Command Center at one time. The Command Duty Officer (CDO) is in charge of the watch floor and stands a 24 hour watch beginning at 0900 each day. Due to the length of the CDO's watch, sometimes the CDO naps or sleeps when the watch floor is quiet. The CDO ensures that all of the required tasks are completed and provides any necessary assistance to the other watchstanders. The Operations Unit (OU) watchstander is in charge of receiving information through phone calls and the SARSAT system. When there is a SAR case, the OU coordinates assets and develops SAR plans. The Situation Unit (SU) watchstander, sometimes referred to as a Marine Safety Watch, receives and takes action on all information that is not related to SAR, including issues related to marine safety or waterway events. The SU will also assist the other members of the watch team as necessary. The OU and the SU stand 12 hour watches, beginning at 0600 and 1800.[248]

8.10.5. The District Eight CDO stated that the Command Center watchstanders spot check weather forecasts for a sampling of locations within the District. They use the National Weather Service website or the weather.com website to obtain the forecasts. Once they obtain the forecasts, the watchstanders do not actively monitor NWS information and they do not receive NWS warnings. The District Eight Command Center does not distribute any weather warnings.

8.10.6. The District Eight Command Center views AIS data on a Coast Guard program called CG One View. The District Eight CDO stated that as the Command Center watchstanders open up more computer programs, their computers slow down.

8.10.7. When the District Command Center receives an EPIRB alert, the notification will automatically come to the SARSAT system, which is on a computer in the Command Center.[249] The District Eight Command Center receives EPIRB alerts for their Area of Responsibility, but they do not receive an EPIRB alert during every single watch rotation. When the District Command Center does receive an EPIRB alert, either an initial alert or an updated position, there is an audio alert and a pop up screen on the computer. Each EPIRB alert generates a new pop up, and the watchstander has to acknowledge the pop up on the computer. When an initial EPIRB alert is received, the first response step is to have one of the watchstanders call the vessel's point of contact listed on the EPIRB's registration information. At the time of the incident, there were a large number of accidental EPIRB activations and false alerts, so the purpose of the phone call was to determine whether the vessel was actually in distress. The District Eight Command Duty Officer stated that if an EPIRB is activated, the watchstanders will call each phone number listed on an EPIRB registration until they get in touch with someone. He stated

[248] Exhibit 243
[249] *Id.*

that it would be advantageous to have multiple phone numbers listed for an EPIRB registration.

8.10.8. If an EPIRB is activated, but it is not registered, then it is very difficult to determine whether the vessel is in distress. If there is a position associated with an unregistered EPIRB alert, then the District Eight watchstanders will ask the Sector Command Center to make radio calls. They can also ask the Sector to make radio calls for a registered EPIRB alert, if they cannot get in touch with a point of contact, or if the point of contact does not know the status of the vessel. The watchstanders will also check AIS data to see if they can locate the vessel, or if they can identify another vessel operating in the vicinity of the EPIRB alert. If the radio calls do not provide any additional information within a few minutes, the Command Center will identify, and then launch, a Coast Guard asset.

8.10.9. If a command center watchstander contacts a vessel with an active EPIRB alert and the vessel's crew says that the vessel is not in distress, then the watchstander will ask a crewmember to look at the EPIRB and provide the identification number. That way, the watchstander can confirm that the EPIRB alert is actually associated with the individual who is stating that they are not in distress.

8.10.10. Once an EPIRB is activated, it will continue to send signals to the satellites, and the system will continue to send position updates to the appropriate command center. The District Eight Command Center has a screen to display SARSAT alerts. The screen tells the watchstanders whether an EPIRB was detected by a satellite or if the EPIRB provided its own position using an internal GPS.

8.10.11. All EPIRB alerts go to the District Eight Command Center; they do not go to the Sector Command Centers. A Sector Command Center only knows about an EPIRB alert if the District watchstander shares the information. Since EPIRB alerts only go to District Command Centers, many of the Coast Guard's Command Center watchstanders do not receive much training regarding EPIRBs and EPIRB alerts. Most of the EPIRB training is provided by the individual Districts. EPIRB procedures are not standardized across Districts. The District Eight Command Center does not have procedures to address a situation involving multiple EPIRB alerts at the same time.

8.10.12. Each EPIRB has an individualized 15-digit beacon identification number. When an EPIRB is activated, the system also assigns a site identification number, which is a shorter, five-digit number used for easier reference during active cases.

8.10.13. An EPIRB summary sheet records information about an EPIRB activation, including the registration information, the site identification number, and the data regarding the EPIRB's positions. EPIRB summary sheets use Greenwich Mean Time (GMT) to record times associated with each position. The summary sheets also list a homing frequency used by the beacon.

8.10.14. When an EPIRB alert comes in, the watchstander enters the EPIRB position into a Coast Guard program called Search and Rescue Optimal Planning System (SAROPS) in order to plan for the search and rescue case. When entering the information into SAROPS, the watchstander uses the time that the EPIRB signal was detected, not the time that the alert arrived at the Command Center.

8.10.15. The District Eight Command Center can view SARSAT and SAROPS information simultaneously on the computer, but any other programs, including CG One View, have to be opened separately. When the watchstanders open separate programs, their computer's level of performance is often reduced.[250]

8.10.16. Even after a watchstander determines that an EPIRB alert is not associated with a distress situation, the Command Center continues to receive audio alerts and computer pop up screens about the EPIRB. This continues until the EPIRB drains its battery or NOAA suppresses the signal from that particular EPIRB. Once a watchstander determines that an EPIRB alert is not associated with a distress situation, the Command Center records the case information in the Coast Guard's documentation database and on a NOAA website.

8.10.17. The District Eight Command Center is responsible for tasking the District's 154 foot Fast Response Cutters. On the day of the incident, the BENJAMIN DAILY was located in Corpus Christi, and that was the only available Fast Response Cutter at the time.

8.10.18. When a Coast Guard aircraft, boat or cutter is in a B0 status, then that asset is prepared for immediate dispatch. If an asset is in a B6 status, then they can be airborne or underway in six hours, and a B24 status means the asset can be airborne or underway in 24 hours.

8.10.19. The Coast Guard SAR Addendum states that a Mass Rescue Operation (MRO) is a situation where the Coast Guard needs to provide immediate assistance to a large number of persons in distress, and doing so would exceed the capabilities normally available to the SAR authority. The Sector New Orleans CDO stated that this incident fell in the category of a MRO.

8.10.20. Coast Guard Sector New Orleans is located in New Orleans, LA, across the Mississippi River from the District Eight Offices and Command Center. Sector New Orleans is responsible for Search and Rescue within an area that covers from White Lake, Louisiana to Pearl River, and offshore out to 200 nautical miles.

8.10.21. The Sector Command Center is responsible for SAR mission coordination and tactical control of search and rescue units in its AOR. The Sector Command Center initiates and manages all initial operational activity related to distress calls, search and rescue, marine

[250] Exhibit 243

casualties, pollution and routine operations for the Sector. The Sector Command Center uses quick response cards to guide their actions. The Sector Command Center is the conduit that feeds information to all of the various departments within the Sector.

8.10.22. There are four different watchstander positions at the Sector New Orleans Command Center. The Command Duty Officer (CDO) manages all of the watchstanders and ensures that they operate efficiently and effectively. The CDO serves as the direct representative of the Sector Commander during initial operational activities. The Operation Unit controller is responsible for executing all of the operational missions, including responses to marine casualties, search and rescue cases, or pollution response. The Situation Unit watchstander is responsible for maintaining a common operating picture of vessel traffic, port conditions, and any other situations that could influence maritime activities. The Communications Unit watchstander is responsible for all maritime communications for the Sector. Each watchstander maintains a chronological log of information obtained during their watch.

8.10.23. All of the Sector Command Center watchstanders are on a 12 hour watch schedule, beginning at 0445 and 1645 each day. There is one qualified and certified watchstander assigned to each position.

8.10.24. The Sector New Orleans Command Center is equipped with phones, computers, and VHF radios. The Communications Unit watchstander uses the radios to monitor VHF Channel 16. The VHF radios provide a bearing line for each radio transmission, which indicates the direction between the radio tower and the transmission location. The VHF radios also receive Digital Selective Calling alerts on Channel 70.

8.10.25. The Sector Command Center does not receive EPIRB alerts directly. They typically receive information about EPIRB alerts over the phone from the District Command Center.

8.10.26. The Sector Command Center obtains weather forecasts from the NWS and NOAA websites. Some of the Sector personnel also receive NWS advisories through their work email. The Sector CDO stated that the Sector Command Center could broadcast NWS weather warnings over VHF, but he did not think it was a Coast Guard requirement. The Sector CDO recalled that the Sector Command Center had broadcast gale warnings or small craft advisories over VHF in the past.

8.10.27. When a Sector Command Center is notified of a possible search and rescue case, they gather information about the case, take initial response actions, prepare a search plan, execute the plan, and continue to re-evaluate the situation and adjust the plan as necessary. As the Command Center watchstanders work a search and rescue case, they report to a Search and Rescue Mission Coordinator (SMC), who is responsible for the entire situation and maintain a big picture view of the incident and the response. The SMC ensures that watchstanders consider all possible scenarios, verify their assumptions,

and are taking appropriate action. The SMC does not operate out of the Command Center, but comes in periodically to review images, plans or other information.

8.10.28. During initial response actions, the Communications Unit watchstander typically issues an Urgent Marine Information Broadcast over VHF to alert other mariners to the situation.

8.10.29. The Sector Command Center uses a program called Search and Rescue Optimal Planning System (SAROPS) to plan for search and rescue cases. The program allows the Sector to enter information about search objects, times, locations, and/or environmental conditions, and then calculates the most probable locations of the search objects over time. Four separate search objects can be entered into the program and calculated at the same time. SAROPS also provides recommended search patterns based on the highest probability of success. The watchstanders then use the SAROPS results and their knowledge of on scene conditions to plan search patterns for all the responding assets. Once individuals or objects are recovered during a search, the watchstanders can compare the recovery locations to the SAROPS results. If there are differences between the two, the watchstanders can review their planning assumptions and the inputs to SAROPS.

8.10.30. The Sector Command Center has the authority to launch various Coast Guard assets in order to execute a search plan, including 87 foot cutters, and 45 foot, 29 foot and 24 foot rescue boats. In general, larger cutters and boats have greater capabilities, endurance and capacities. The Sector Command Center can also call the District Command Center to request the launch of aircraft or larger cutters managed by the District. The Sector Command Center sometimes contacts other government agencies or port partners to ask for assistance in a search.

8.10.31. The SAR Addendum requires the Coast Guard to notify a missing individual’s next of kin about the search and rescue efforts as soon as possible. After the initial notification, a designated Coast Guard representative serves as the single Coast Guard point of contact for the family and maintains daily contact with the next of kin.

8.10.32. The U.S. Army Research Institute for Environmental Medicine developed a tool called the Probability of Survival Decision Aid (PSDA) to predict survival times for cold-water immersion, and for cold air exposure. The Coast Guard uses the PSDA application for cases involving people in the water and cases where individuals were are not immersed but are at risk of hypothermia. The PSDA predicted a functional time (at the end of mild hypothermia) and a survival time (at the end of moderate hypothermia). The times account for the cooling of an individual’s core based upon weather, sea conditions, clothing, and the individual’s physical characteristics. The PSDA assumes that a person would lose the cognitive capacity to prolong their life at the functional time, and expects a person to lose consciousness at the survival time. The SAR Addendum states that PSDA times are not considered absolute values, but they are used as guidelines for search planning and case suspension.

8.10.33. As noted in the SAR Addendum, the Coast Guard cannot continue to search for missing individuals indefinitely. At some point in a search, the Search and Rescue Coordinator decides to stop. According to the SAR Addendum, this is a judgment call based on careful analysis, and it is usually done when there is no longer any reasonable probability that an individual is alive, or when additional search does not significantly increase the probability of success. In these situations, a search is discontinued, or actively suspended (ACTSUS). The Search and Rescue Coordinator (in this case the Sector Commander) has the authority to make the decision to actively suspend a search. The search can resume if new information is received and that information indicates that the object of the search may not be in the areas searched, or if new details regarding the search object were not previously reported. The SAR Addendum states that the next of kin should be notified of a decision to actively suspend a case about one day before the actual suspension.

8.10.34. The SAR Addendum states that when an emergency warrants response in addition to SAR, the Incident Command System (ICS) organizational structure should be used to manage the overall response. Examples of other activities that are not SAR but are often closely associated with a large SAR incident, include: search and recovery, salvage, investigation, firefighting, and pollution response.

8.10.35. Within District Eight, there are four Air Stations. At the time of the incident, Sector/Air Station Corpus Christi had three HC-144 aircraft, which are dual engine airplanes, and three MH-65 helicopters. Air Station Houston-Galveston had three MH-65 helicopters. Air Station New Orleans had five MH-65 helicopters. The Aviation Training Center in Mobile, AL had three HC-144s available to assist with Search and Rescue cases. ATC also had MH-60 and MH-65 helicopters assigned to their training division, but these aircraft were not available for immediate launch in a Search and Rescue case. At the time of the incident, Sector/Air Station Corpus Christi could authorize the launch of their own aircraft, and the District Eight Command Center could authorize launching aircraft from Air Station Houston-Galveston, Air Station New Orleans, and ATC Mobile.[251]

8.10.36. At the time of the incident, Air Station Clearwater had MH-60 helicopters, but they were under the control of District Seven.

[251] Exhibit 243

8.10.37. The Coast Guard SAR Addendum provides the following information regarding aircraft capabilities and features:

	MH-65 Helicopter	**MH-60 Helicopter**	**HC-144 Airplane**
Max weight (lbs)	9,480	21,884	36,340
Max endurance (hrs)	3.5	6	11
Cruise speed (ktas)	125	125	220
Max range (nm)	375	700	2,000
Radius of action	120 (with swimmer)	300	880
Hoist	X	X	
Sling	X	X	
Basket	X	X	
Litter	As needed	X	As needed
Pump	As needed	X	X
SLDMB	As needed	As needed	X
Survival kits			X
Searchlight	X	X	
AIS receiver			X

Table 5: Coast Guard Aircraft Capabilities and Equipment

8.10.38. In addition to the items listed in the table above, all three types of aircraft are also equipped with flares, a homer, data marker buoys, a raft, radios, night vision goggles, FLIR, surface search radar, and weather radar.

8.10.39. If Coast Guard aircraft are not available for a mission, the District Eight Command Center can contact partner agencies, such as Customs and Border Protection, or the Air Force, to see if they have assets available to assist.

8.10.40. The SAR Addendum states that the Coast Guard is committed to careful risk management so that they do not unnecessarily endanger the lives of Coast Guard crews and the lives of those they go out to save. The SAR Addendum also states that no small boat or aircraft, no matter how well maintained or skillfully piloted, can be expected to survive, much less perform a rescue, when wind and sea conditions are beyond the limitations of hull, airframe or the humans that operate them.

8.10.41. The Coast Guard has pre-established operational limits for each type of aircraft and for each cutter and small boat. If an Aircraft Commander is comfortable flying in weather that exceeds the operational limits, they can request a waiver to operate. If the crew on a cutter or small boat is comfortable operating in weather that exceeds their operational limits, then the crew can request an operational waiver from the Sector Commander. The crews on a small boat are also required to request a separate waiver from the Station Commanding Officer if they want to get underway in a high risk situation.

8.10.42. Sector New Orleans has operational control over Small Boat Stations located in New Orleans, Venice, and Grand Isle. Station Grand Isle conducts search and rescue, law enforcement, fisheries and recreational boating safety activities. Station Grand Isle is

equipped with phones, computers and VHF radios; their Area of Responsibility is from Vermillion Bay to Bassa Bassa Bay, and offshore 50 nautical miles. Station Grand Isle is considered a "one boat" station, meaning the unit is prepared to have one boat underway at any time. Station Grand Isle has two 45-foot response boats and two 24-foot shallow purpose craft. One of the Station Grand Isle Coxswains stated that the operational parameters for the 45-foot response boats is 10-foot seas and 30 knot winds. The boats are equipped with heavy weather harnesses.

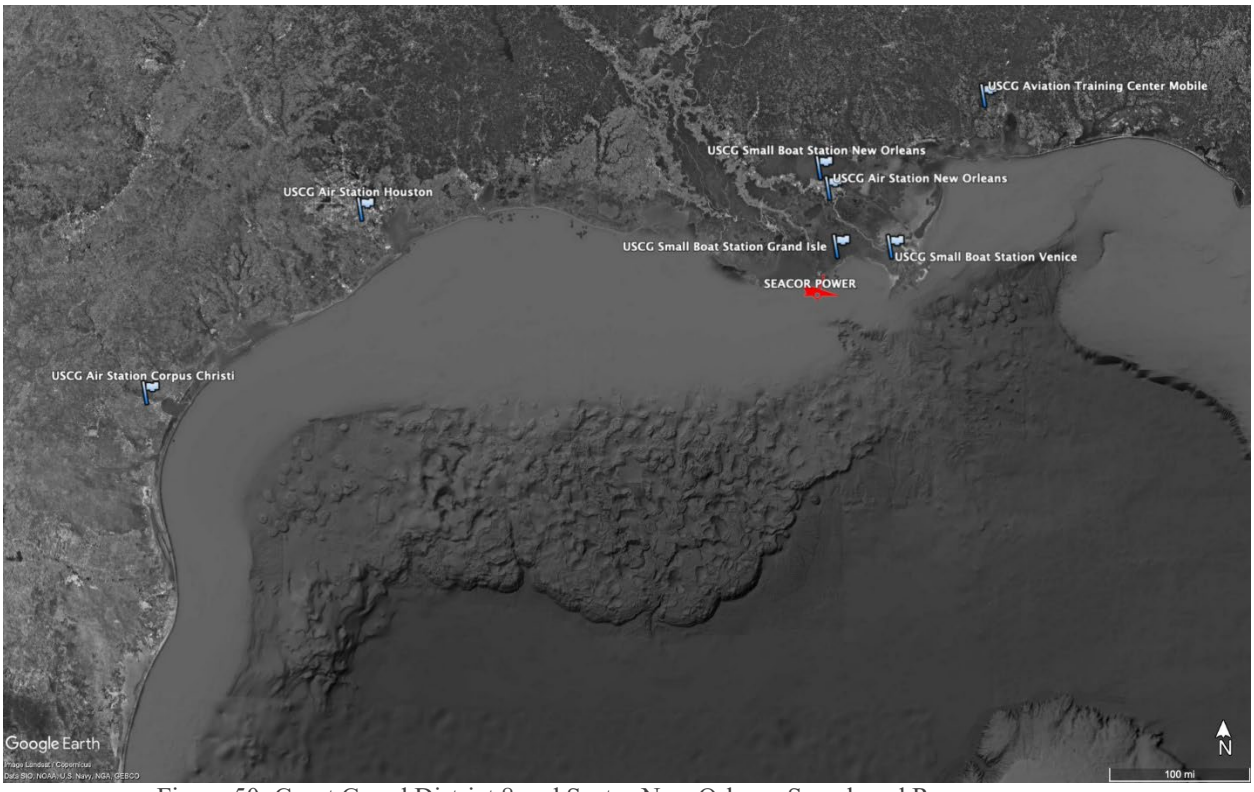

Figure 50: Coast Guard District 8 and Sector New Orleans Search and Rescue resources

8.10.43. Station Grand Isle boat crews stand a two-day-on/two-day-off rotation, with sliding weekends; they work for 48 hours, they are off for 48 hours, and every other weekend they work for 72 hours.

8.10.44. Each crewmember on a Coast Guard 45-foot response boat is required to wear a Personal Locator Beacon (PLB).

8.10.45. At the time of the incident, Coast Guard patrol boats and Coast Guard fast response cutters were required to carry line throwing guns. Coast Guard small boats are not required to carry line throwing guns.

8.10.46. The District Eight CDO stated that the Coast Guard does not have any underwater rescue capabilities and the Coast Guard does not have a procedure for identifying other entities that may be able to assist with underwater rescue. The Sector CDO stated that there are no agreements with local entities to provide underwater rescue support.

8.10.47. The Coast Guard SAR Addendum states that the Coast Guard is not mandated to perform underwater rescues, but the Coast Guard is statutorily responsible for developing, maintaining, and operating facilities for the promotion of safety under, on, and over the high seas and navigable waters subject to the jurisdiction of the United States. Traditionally, the Coast Guard assists distressed persons wherever and whenever possible, and that responsibility extends to people trapped in capsized or sunken vessels. However, the addendum also states that persons trapped under capsized vessels or in compartments pose extreme safety risks to both the victim and the SAR responders, and the Coast Guard resources for rescue in these cases are severely limited.

8.10.48. The Coast Guard SAR Addendum states that all Command Centers shall maintain a current Search and Rescue Facility listing, and that the list shall be validated annually. At the District or Sector level, the list shall include all assets available within that unit's area of responsibility that can assist in responding to SAR. The facility listings are particularly important for identifying capabilities not held by the Coast Guard. The listings of dive rescue resources must include all available agencies and organizations with dive rescue capabilities. The Addendum also states that dive rescues generally require an immediate response, so the listings must include means for contacting dive teams 24 hours a day.

8.10.49. Section 6.3 of the SAR Addendum is titled "Persons Trapped in Capsized Vessels", and this section prohibits Coast Guard swimmers from going under the water or entering a capsized or submerged object. For divers, the SAR Addendum refers to COMDTINST M3150.1. This manual is the Coast Guard's Dive Program Manual, Revision D, dated December 2018, but it does not address rescue diving.

8.10.50. The SAR Addendum states that SAR missions shall not normally be performed for the purpose of salvage or recovery of property when those actions are not essential to the saving of life.

8.10.51. Bristow is a civilian helicopter company. They provide search and rescue, and passenger transfer services for oil companies in the Gulf of Mexico. The Bristow base in Galliano provides the company's search and rescue services, and they have five helicopters of three different sizes. The company's helicopters always operate with two pilots.

8.10.52. On April 13, 2021, the Sector Command Center Command Duty Officer (CDO) assumed the watch at 0430. The Sector Command Center CDO stated that the Sector watch team was energetic and operationally ready that morning. All of the equipment was functioning properly, with the exception of the phones, which often had bad connections.[252]

[252] Exhibit 243

8.10.53. The District Eight CDO stated that his watch team was well rested that morning, and no one on the team identified any issues of concern. The equipment in the office was working properly that day. The CDO stated that the watch in the District Eight Command Center was relatively quiet until the early afternoon.

8.10.54. At 1217, SEACOR POWER departed the dock in Port Fourchon with 19 individuals aboard.

8.10.55. The District Eight CDO stated the Command Center received an EPIRB alert at approximately 1330, and then a separate alert around 1430. These alerts were not for the SEACOR POWER.

8.10.56. At 1432, the pre-commissioned Coast Guard Cutter GLENN HARRIS departed the Bollinger Fourchon dock. The vessel was scheduled to be commissioned as a Coast Guard Cutter, but at the time the vessel was still under command of the builder, Bollinger Shipyard. The vessel was operated by a Bollinger Shipyard Captain and crew, and the future Coast Guard crew was aboard in a training capacity.

8.10.57. At 1441, ROCKFISH arrived at their intended location, approximately 7 nautical miles south of Port Fourchon.[253]

8.10.58. At 1507, the Master of SEACOR POWER sent an email to Seacor with his evening operations report. The Master noted that there were 18 people on board.[254]

8.10.59. At 1510, GLENN HARRIS arrived at a training location, which was approximately 6 nautical miles east of Port Fourchon.

8.10.60. The Station Grand Isle Operations Petty Officer stated that heavy weather passed over Station Grand Isle, which caused water to come up and over the seawall at the Station, and snapped some of the lines on one of the Station's 24 foot boats. The USCGC MORAY was tied up in Grand Isle at the time, and their crew saw 90 mile an hour winds.

8.10.61. At 1519, SEACOR POWER encountered a rain squall and the First Mate observed that the winds quickly jumped to 79 mph, and then slowed to 30 to 40 mph.

8.10.62. At 1530, the Master of ROCKFISH observed wind speeds increase from 30 to 35 mph, up to 95 mph. His anemometer recorded a wind gust of 112 mph that afternoon.

8.10.63. At 1530, Air Station New Orleans cancelled flights due to bad weather.[255]

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[253] Exhibit 124
[254] Exhibit 140
[255] Exhibit 269

8.10.64. At 1532, SEACOR POWER encountered the second squall and the First Mate observed white-out conditions.

8.10.65. At 1537, SEACOR POWER capsized to starboard. At 1539 the final AIS transmission reported that the vessel was approximately 7 nautical miles south of Port Fourchon.[256]

8.10.66. The Sector CDO stated that the watch in the Sector Command Center was very typical until about 1500, at which time the Sector was heavily inundated with potential distress calls from both commercial and recreational vessels. The Sector CDO stated that there were six or seven distress cases, and SEACOR POWER was the eighth. Before the SEACOR POWER call, an ocean-going tug, located south of Port Fourchon with four people on board, called and reported they were taking on water, their pumps could not keep up, and they were preparing to abandon ship. The Sector contacted District Eight and requested an aircraft for the sinking towing vessel with four people on board. The Sector was also handling a case involving a houseboat that was taking on water with one person and a dozen animals on board.

8.10.67. The District Eight CDO stated that, at approximately 1530, there were five EPIRB alerts in a span of 10 or 15 minutes. Three of the alerts came within one minute of each other, and almost all the alerts were in southern Louisiana. This was an unusually high number of EPIRB alerts, and the CDO had never seen this number of cases at the same time. The CDO stated that the number of cases presented communications challenges. The watch team made phone calls to check on the status of each vessel associated with an EPIRB alert. The watchstanders determined that a number of these EPIRB alerts did not involve distress cases.

[256] Exhibit 45

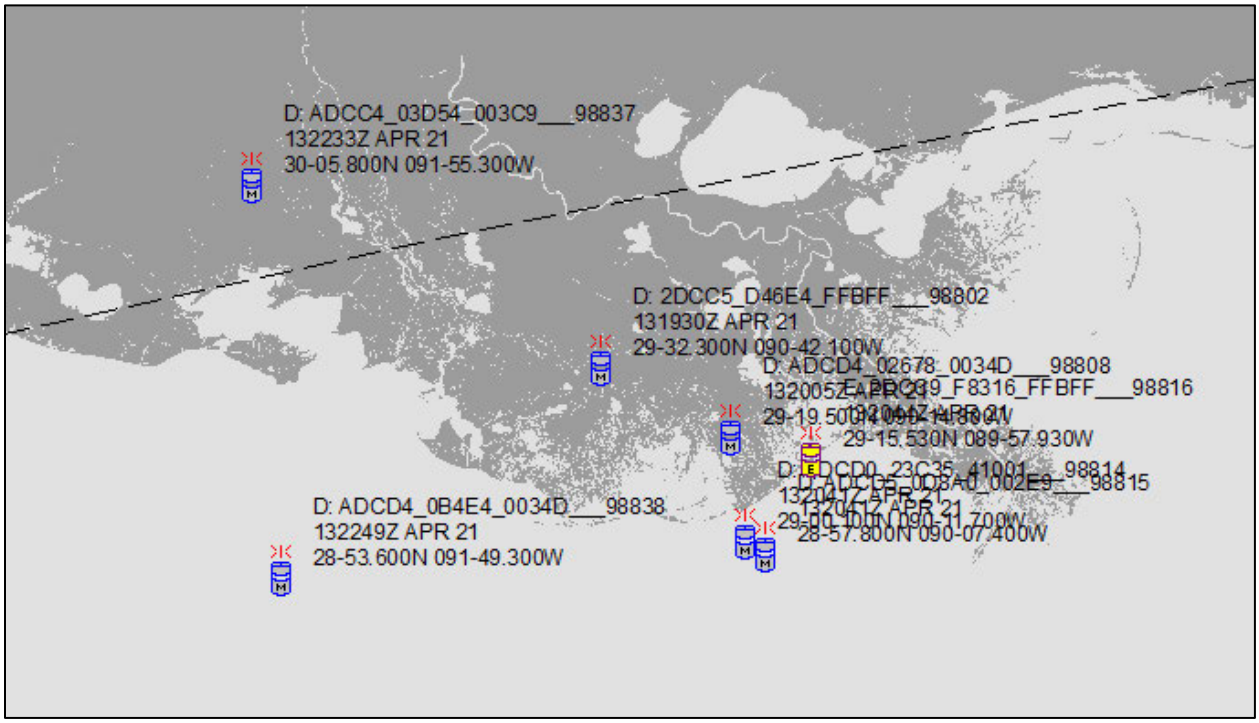

Figure 51: EPIRB Alerts received by Coast Guard District 8 on April 13, 2021

8.10.68. At 1540, Low Earth Orbit (LEO) Satellite G16 received a transmission from SEACOR POWER's Emergency Position Indicating Radio Beacon (EPIRB). This was the first EPIRB alert for SEACOR POWER, and it did not include position information. The U.S. Mission Control Center (USMCC) sent the transmission information to the Coast Guard's District Eight Command Center in New Orleans at 1542. The District Eight CDO stated that the EPIRB alert was sent to District Eight based on the location of the EPIRB registration information.[257]

8.10.69. At 1541, Medium Earth Orbit (MEO) Satellite 005 detected SEACOR POWER's EPIRB and provided a "position unconfirmed" alert. The MEO Satellite reported a beacon location that was 0.3 miles south-southeast of the capsized vessel. The USMCC sent this information to Coast Guard District Eight at 1542.[258]

8.10.70. At 1543, a third satellite, MEO 019, detected SEACOR POWER's EPIRB and provided a "position confirmed" alert. This alert reported a location that was 3.5 nautical miles southeast of SEACOR POWER. The USMCC sent this information to Coast Guard District Eight at 1544.[259]

[257] Exhibit 225
[258] *Id.*
[259] *Id.*

8.10.71. At 1600, the USCGC MORAY was moored at Coast Guard Station Grand Isle, LA. The vessel's crew recorded 75 knot winds coming from the north.[260]

8.10.72. At the same time, Offshore Supply Vessel CHRISTIAN CHOUEST observed visibility less than ¼ mile and 75 knot wind gusts at their location, 4.5 miles west of SEACOR POWER. Between 1600 and 1621 the CHRISTIAN CHOUEST recorded a wind gust of 98 knots.[261]

8.10.73. At approximately 1600, the Master of GLENN HARRIS observed the winds jump from 10 to 15 knots, up to 80 knot winds, within a matter of one to two minutes. The winds remained at 80 knots for 15 to 20 minutes. The cutter was located 11 nautical miles northeast of SEACOR POWER.

8.10.74. At 1600, Air Station New Orleans logged that their aircraft could not take off and respond to a disabled vessel due to bad weather.[262]

8.10.75. The Coast Guard District Eight Command Center OU watchstander called the Seacor Dispatcher at 1605.[263] The D8 watchstander stated that SEACOR POWER's EPIRB activated and asked the Seacor Dispatcher if the vessel was underway or in distress. The Seacor Dispatcher informed the Command Center watchstander that SEACOR POWER was at the dock in Port Fourchon. When asked a second time, the Seacor Dispatcher said, "I pretty much guarantee they're not in distress, I'm sure it was an accidental discharge of it or something like that because they're just sitting at the dock doing maintenance on the vessel." The D8 watchstander asked the Seacor Dispatcher to have the vessel call the Command Center.

8.10.76. The District Eight CDO stated that because the first SEACOR POWER alert was unlocated, and because they were handling multiple EPIRB alerts at the same time, the watchstander based his decision about the EPIRB on the information provided by the Seacor Dispatcher. The watchstander turned his attention to the other EPIRB alerts.

8.10.77. At 1616, the Seacor Dispatcher emailed SEACOR POWER stating that he "received a call at 1607 from the US Coast Guard regarding an EPIRB beacon alert coming from SEACOR POWER." The Dispatcher provided the phone number for the Coast Guard in his email and asked that the SEACOR POWER crew "verify the beacon ID number and inform them of the vessel's status." The Dispatcher copied the Seacor Operations Manager on the email.[264]

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[260] Exhibit 242
[261] Exhibit 7
[262] Exhibit 269
[263] Exhibit 229
[264] Exhibit 210

8.10.78. At 1628, visibility started improving and the Master of Liftboat ROCKFISH saw the overturned SEACOR POWER. He made a VHF MAYDAY call and reported that SEACOR POWER had capsized about six or seven miles south of Port Fourchon. The ROCKFISH Master reported that the winds on scene were 80 to 90 knots, and the seas were 10 to 12 feet, with occasional 16-foot seas. The Sector New Orleans Command Center immediately entered the distress phase. The Sector CDO stated that he did not know how many people were aboard at that time, but that his priority was to get response assets on scene as quickly as possible.

8.10.79. The CHRISTIAN CHOUEST Master heard the VHF call, plotted the position of the capsized vessel, and then transited toward the location of the incident.[265] The crews on the ARATA,[266] ELISE MARY,[267] and the MR LLOYD also heard the VHF call and the vessels headed toward SEACOR POWER.[268]

8.10.80. The GLENN HARRIS Master heard the VHF call from the ROCKFISH Master. He checked his chart and saw the location, then decided to head towards SEACOR POWER. He did not receive any DSC alerts. The Master of GLENN HARRIS called his supervisor at Bollinger Shipyard to let them know the situation. There was rain, reduced visibility, and 40 knot winds during the transit, so the Master proceeded with caution at a safe speed.

8.10.81. The STIM STAR IV Master heard the VHF call from the ROCKFISH Master. Due to the heavy weather conditions and the reduced visibility, the Master stated that he was just trying to maintain heading and position at that time.[269]

8.10.82. The Sector CDO was scheduled to finish his watch at 1630, but he remained in the Command Center until approximately 2400 and continued to run the SEACOR POWER case.

8.10.83. The ROCKFISH Master called the Seacor Dispatcher to notify them that SEACOR POWER had capsized. At 1640, the Seacor Dispatcher emailed Seacor's Qualified Individual to notify him of the call from ROCKFISH.[270]

8.10.84. At 1640, the Sector New Orleans Command Center issued an Urgent Marine Information Broadcast over VHF. The watchstander stated that the Coast Guard received a report of an overturned liftboat.

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[265] Exhibit 7
[266] Exhibit 239
[267] Exhibit 4
[268] Exhibit 237
[269] Exhibit 271
[270] Exhibit 209

8.10.85. At 1645, the Seacor Operations Manager called the District Eight Command Center.[271] He told the Command Center that he received a notification about the SEACOR POWER's EPIRB activation and wanted to know if the Coast Guard had any information about the incident. The District Eight CDO stated that during the call, the Seacor Operations Manager stated that there were 7 persons on board SEACOR POWER.

8.10.86. The District Eight CDO said that around the time that the Seacor Operations Manager called, the Sector New Orleans Command Center also called and reported an overturned vessel. The District Eight CDO said that was the point when he and his watchstanders correlated the SEACOR POWER EPIRB alert with the overturned vessel report from Sector New Orleans. The CDO stated that, because of the earlier conversation with the Seacor Dispatcher, and the statement that SEACOR POWER was at the dock, it took extra time to correlate the EPIRB alert with the information from Sector. After the call from Sector New Orleans, the District Eight watchstanders looked at the position information on the SEACOR POWER EPIRB alerts and identified that the vessel was not actually at the dock. The District Eight CDO stated that if he had confirmed SEACOR POWER's distress earlier that day, then he could have had additional time to plan the response but may or may not have been able to launch assets any earlier.

8.10.87. The Sector Command Center contacted District Eight and requested the launch of all available aviation assets. The District Eight CDO stated that he contacted Air Station New Orleans and Aviation Training Center Mobile, but they could not launch their aircraft due to bad weather, including wind, rain and lightning. The weather was so bad in Mobile, that commercial aircraft were being diverted away from the airport there. The Air Stations said that they would continue to reassess the weather to identify when it was safe to launch. The District Eight CDO considered launching a helicopter from Houston, but he discounted this option because he thought the helicopter could have taken off but would not have a safe place to land for refueling.

8.10.88. Around this time the District Eight Command Center heard that there was a Coast Guard cutter in the area. The District Eight CDO contacted his supervisor to discuss the possibility of obtaining aircraft support from Corpus Christi. He agreed, and the District Eight CDO contacted Air Station Corpus Christi to request support for SEACOR POWER and six other search and rescue cases. One of the other search and rescue cases involved a person who was blown off the deck of a vessel and into the water.

8.10.89. Due to the number of search and rescue cases, the Sector Command Center broke their watch into two separate sections, one section to handle SEACOR POWER, and the other section to handle the remaining search and rescue cases.

[271] Exhibit 256

8.10.90. Cardinal Worker 4 was swept off the hull, onto the crane railing, and then into the sea.

8.10.91. At 1701, GLENN HARRIS arrived on scene.[272] The Master stated that he did not see any SART signals. The Master and the crew observed a small portion of SEACOR POWER's port side superstructure was above the water, with five individuals hanging on. The Bollinger Shipyard crew on GLENN HARRIS launched the small boat and approached SEACOR POWER, but the superstructure and the helo pad, which were just below the waterline, prevented the small boat from getting close to the five individuals. None of the individuals attempted to get into the water, so the small boat returned to GLENN HARRIS, unable to rescue any personnel from SEACOR POWER.

8.10.92. At 1723, the Sector Command Center designated the GLENN HARRIS as the On-Scene Commander[273] and asked the vessel to remain near the capsized vessel. The GLENN HARRIS crew maintained communications with the Sector and organized the on-scene operations.

8.10.93. The Sector Command Center did not provide any of the Good Samaritan vessels with a search pattern. The Good Samaritan vessels searched the debris field on their own.

8.10.94. At approximately 1725, Sector New Orleans called Station Grand Isle and asked them to launch their 45-foot Response Boats.

8.10.95. The crew of Rescue Boat 45674 collectively determined that their operations had a high risk, but also a high gain. Due to the high-risk situation, that boat crew needed a waiver from the Station Commanding Officer. The Commanding Officer was there at the dock and granted the request. There were three people aboard: the Coxswain, the Engineer, and the Crewmember.

8.10.96. The crew of Rescue Boat 45687 assessed their risk as medium and did not require a waiver to get underway. There were four people aboard: the Coxswain, the Engineer, the required Crewmember, and an extra Crewmember.

8.10.97. Neither one of the Station Grand Isle Coxswains remembered receiving any type of Coast Guard training regarding SARTs. The Coxswains both stated that the Response Boats were functioning well that day, but the radios were operating intermittently. They said that once on scene, many of their communications with Sector New Orleans had to be relayed through the GLENN HARRIS.

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[272] Exhibit 17
[273] *Id.*

8.10.98. At approximately 1728,[274] the crewboat ARATA spotted Cardinal Worker 4 in the water, but the crew could not recover him. Offshore Supply Vessel ELISE MARY came to assist. At 1742, ELISE MARY rescued Cardinal Worker 4 at 28°59.52'N, 090°13.55'W.[275] This position was 1.7 nautical miles west-southwest from the SEACOR POWER's final position.[276]

8.10.99. At 1730, the Response Boats left the Station Grand Isle dock. The crews observed 8 to 10-foot seas as the boats departed. After about ten minutes, as the boats exited Barataria Bay, they observed 40 to 50 knot winds and 10 to 12-foot seas, which exceeded the boats' operating parameters. One of the Coxswains called back to Station Grand Isle and requested a waiver to continue operating. The boats continued to proceed toward SEACOR POWER while they waited for an answer regarding the operational waiver. At approximately 1755, the Sector Commander approved the operational waiver for Station Grand Isle's Rescue Boats to continue their Search and Rescue efforts in weather conditions that exceeded the boat's operational parameters.

8.10.100. On the way to SEACOR POWER, CG 45687 heard a radio call and diverted to conduct a search for a nearby case involving an overturned tender vessel. The crew conducted the search and then resumed the transit to SEACOR POWER.

8.10.101. At 1745, Offshore Supply Vessel CAPE COD was transiting in the vicinity of the capsized vessel and the crew saw a liferaft. They reported it to Sector New Orleans, checked the liferaft and did not find anyone inside, and then they joined the search.[277]

8.10.102. At 1748, Offshore Supply Vessel CHRISTIAN CHOUEST located the Night Captain in the water at 28°58.459'N, 090°15.972'W (approximately 4 nautical miles west-southwest from the capsized SEACOR POWER).[278] When CHRISTIAN CHOUEST announced the position over VHF, OSVs ARATA, ELISE MARY, and MR LLOYD moved toward the position to assist and search.[279] The Night Captain stated that he did not have the strength to swim towards the vessel or to climb onto the vessel. The CHRISTIAN CHOUEST maneuvered closer to the Night Captain. The vessel's crew attached a tether to their Chief Engineer and he jumped into the water to assist the exhausted Night Captain. At 1802, the CHRISTIAN CHOUEST crew recovered the Night Captain in position 28°58.110'N, 090°16.954'W.[280]

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[274] *Id.*
[275] Exhibit 4
[276] Exhibit 124
[277] Exhibit 2
[278] Exhibit 7
[279] Exhibit 237
[280] Exhibit 17

8.10.103. The District Eight CDO stated that throughout the afternoon and evening there were conflicting reports of the number of people on board SEACOR POWER. Some of the survivors stated it was 17, and some of the company representatives stated it was 18. The District CDO stated that regardless of the number of people on board, the Coast Guard would do everything they can to save the lives of those involved. The Sector CDO stated they received reports of 17 people on board.

8.10.104. At 1756, the Seacor QHSE Manager sent an email to the Sector New Orleans Command Center stating there were 18 people aboard SEACOR POWER.[281]

8.10.105. At approximately 1805, Shell's Gulf of Mexico Aviation Manager called a representative at the civilian helicopter company, Bristow, to discuss aviation matters. At the end of the call, Shell's Aviation Manager mentioned that he had heard about a capsized jack-up barge near Port Fourchon. After the call, the Bristow representative contacted the on-duty crew at the Bristow facility in Galliano, LA, and told them that there was a possible vessel in distress, and they may be asked to assist.[282]

8.10.106. At approximately 1808, Offshore Supply Vessel MR LLOYD located the Company Man in position 28°58'N, 090°18'W, approximately 5.6 nautical miles west-southwest of the capsized SEACOR POWER[283] and 300 feet from the location where CHRISTIAN CHOUEST rescued the Night Captain. The crew of MR LLOYD threw a lifering on a 90-foot lanyard to the Company Man. Then a crewmember entered the vessel's rescue platform and the crew lowered it. The crewmember was able to hold onto the Company Man and help him onto the platform and aboard the vessel. The Company Man had minor injuries and did not require first aid.[284]

8.10.107. At 1809, GLENN HARRIS' Forward Looking Infrared (FLIR) operator witnessed Cardinal Worker 2 fall from SEACOR POWER into the water.[285] The Master of GLENN HARRIS maneuvered the vessel near Cardinal Worker 2 as he drifted. Once they were close enough, the crew threw him a lifering. He grabbed on and the crew pulled him over to the Jacob's Ladder, where Cardinal Worker 2 climbed up and onto GLENN HARRIS. The GLENN HARRIS log stated that he was recovered at 1815.

8.10.108. The Sector Command Center diverted the 87 foot Coast Guard Cutter AMBERJACK to come assist with the SEACOR POWER search and rescue case.

[281] Exhibit 228
[282] Exhibit 267
[283] Exhibit 239
[284] Exhibit 237
[285] Exhibit 17

8.10.109. At 1815, Coast Guard Cutter AMBERJACK got underway. They departed their location near Vermillion Bay (approximately 110 nautical miles west-northwest of the SEACOR POWER capsize site) in order to assist with the search efforts.[286]

8.10.110. The Sector Command Center also asked District Eight for support from Coast Guard Cutter BENJAMIN DAILEY. The District Eight CDO stated that they started to make phone calls to request support from the cutter, which was near Corpus Christi. The cutter started making preparations to obtain fuel and supplies, and then get underway to support the response.

8.10.111. At 1816, Offshore Supply Vessel CAPE COD sighted the First Mate at 28°56.246'N, 090°16.820'W (approximately 6 nautical miles southwest of the capsized vessel). At 1830, the CAPE COD crew rescued the First Mate.[287]

8.10.112. At 1831, the Seacor QHSE Manager sent another email to Sector New Orleans stating that there were 19 people aboard SEACOR POWER, along with the name of each person.[288]

8.10.113. At around 1835, a representative from Bristow called the Sector New Orleans Command Center and asked about the capsized vessel. Bristow offered helicopter assistance, and the Sector New Orleans watchstander accepted the offer. The Bristow representative obtained authorization to conduct search and rescue operations from Bristow's company management. Then the Bristow representative contacted the on-duty crew at the Galliano facility and asked them to launch.

8.10.114. Coast Guard Station Grand Isle's Response Boat 45674 arrived on scene with the capsized SEACOR POWER at 1839, and Response Boat 45687 arrived on scene at 1849.[289] There were about 45 minutes of daylight remaining. The Coxswains observed 40 to 60 knots of wind, and 10 to 12-foot seas, with occasional 15-foot seas. The Coxswain of CG 45674 stated that she had only operated in that type of weather condition during a training evolution. The Coxswain of CG 45687 stated that he had operated in 10 to 12-foot seas before but had never operated with winds that high.

8.10.115. The Coxswains positioned their vessels downwind of SEACOR POWER. The Coxswains stated that the waves were crashing over the individuals on the superstructure. They said that as they moved the response boats closer to the capsized vessel, the seas acted differently, and the seas were like a "washing machine." They could not get close

[286] Exhibit 240
[287] Exhibit 2
[288] Exhibit 228
[289] Exhibit 23

enough to recover the remaining individuals without potentially damaging the response boats and placing their own crew in an emergency situation.

8.10.116. The Coxswain of CG 45687 told his crew to put on heavy weather harnesses before they went out onto the deck of the response boat, and to clip into the vessel when they were out there. The Coxswain brought the boat to within about 20 feet of the capsized vessel. He stated that part of SEACOR POWER's structure was about five feet below the keel of the response boat. The Coxswain of CG 45687 directed his Engineer to go to the bow on the response boat and yell to the individuals on SEACOR POWER. The Engineer told them that if they got in the water, the response boat would pick them up as soon as they were clear. A/B 1 worked his way down to the water. Due to the waves, he washed on and off SEACOR POWER twice, suffering a major abdominal laceration.

8.10.117. At 1856, A/B 1 entered the water.[290] The crew of CG 45687 extended a boat hook and A/B 1 grabbed on. The crew pulled him close to the boat and helped him aboard. The crew administered first aid to A/B 1.

8.10.118. At 1906, Response Boat 45687 notified GLENN HARRIS that they were going into Port Fourchon due to A/B 1's injuries.[291] After Response Boat 45687 departed, the Coxswain of Response Boat 45674 moved up closer to SEACOR POWER. The crew tried to find a way to communicate with the people on the capsized vessel.

8.10.119. The Master of STIM STAR IV stated that the weather started to subside, and he slowly moved the STIM STAR IV towards SEACOR POWER.[292]

8.10.120. Bristow Helicopter 739 departed Galliano at 1934.[293] The Bristow Hoist Operator stated that the front had passed and there was no longer lightning over their location in Galliano, but the winds were still incredibly strong on the flight out.

8.10.121. At 1951, Coast Guard Fixed Wing "Casa" Aircraft 2317 arrived on scene.[294] The air crew deployed three self-locating data marker buoys near the capsized vessel. The buoys validated the Command Center's search planning assumptions and the information they were obtaining from SAROPS.

8.10.122. Bristow Helicopter 739 arrived on scene at 1953.[295] When they arrived on scene, the winds were about 40 knots. The air crew saw the individuals remaining on SEACOR POWER and they waved to the helicopter. The pilots radioed the Coast Guard boats to

[290] Exhibit 17
[291] *Id.*
[292] Exhibit 271
[293] Exhibit 177
[294] Exhibit 17
[295] *Id.*

let them know their capabilities. The pilots hovered about 80 feet above the water, and the Hoist Operator lowered the Rescue Swimmer on the cable. They maneuvered the Rescue Swimmer to a position very close to the individuals on SEACOR POWER, but due to the orientation of the vessel, the individuals were underneath the railing and the Rescue Swimmer could not reach them. The Hoist Operator recovered the Rescue Swimmer and the air crew discussed possible options. The air crew decided the best option was to try and get the individuals to enter the water. The Hoist Operator lowered the Rescue Swimmer again, but he could not convince anyone to get in the water. The Hoist Operator recovered the Rescue Swimmer again.

8.10.123. At approximately 2041, the crew of GLENN HARRIS asked Bristow Helicopter 739 if they could lower lifejackets and a radio to the individual remaining on SEACOR POWER. The air crew agreed, and lowered a bag containing those items.[296] Once the individuals on SEACOR POWER had the bag, the helicopter departed the scene in order to reduce the noise levels and allow for easier radio communications. The Response Boats began communicating back and forth with the individuals. The Coxswain of CG 45674 stated that they were scared and hesitant. One of the individuals on SEACOR POWER stated that he couldn't swim.

8.10.124. One of the District Eight Command Center watchstanders called Coast Guard Headquarters to discuss the status of GLENN HARRIS. The Headquarters representative told the watchstander that the cutter was still managed by Bollinger shipyard, and that the Coast Guard had not yet taken possession. The watchstander also talked with a representative from Bollinger Shipyard, and they agreed that the GLENN HARRIS was operating in the capacity of a Good Samaritan.[297]

8.10.125. Around 2045, the GLENN HARRIS contacted the two individuals remaining on SEACOR POWER. The Prospective Commanding Officer of GLENN HARRIS, who was aboard the vessel for training that day, talked on the radio to Cardinal Worker 3. He tried to keep Cardinal Worker 3 and the others calm. He talked about the cutters and aircraft that were there to assist. The Master of GLENN HARRIS stated that the waves were crashing against the superstructure and deck of SEACOR POWER.

8.10.126. Bristow Helicopter 739 returned to the scene, and the Hoist Operator lowered the Rescue Swimmer for a third time. He could not convince any of the individuals on SEACOR POWER to enter the water. The helicopter was running low on fuel, so the Hoist Operator recovered the Rescue Swimmer.

8.10.127. At 2059, Coast Guard Response Boat 45687 returned to the scene, after successfully delivering A/B 1 to emergency medical service personnel in Port Fourchon.

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[296] *Id.*
[297] Exhibit 15

The Coxswain began working with Fixed Wing Aircraft 2317 on a plan to get a liferaft to the individuals on SEACOR POWER.[298] The Coxswain stated that he was going to get a liferaft and maneuver it closer to the individuals on SEACOR POWER, but the winds and the seas were too rough.

8.10.128. At 2101, Bristow Helicopter 739 departed the scene[299] and landed in Galliano to refuel at 2117.[300] The Hoist Operator stated the air crew discussed additional rescue options while they refueled.

8.10.129. At 2119, GLENN HARRIS reported that one of three individuals remaining on the hull slid off into the water. Both Coast Guard Response Boats, Offshore Supply Vessel STIM STAR IV, and Coast Guard Aircraft 2317 focused their search efforts on this individual.[301]

8.10.130. At approximately 2123, Response Boat 45674 located an unresponsive person in the water and attempted to recover them. A boat crewmember pulled the person closer and brought them to the recess (lower portion of the deck) of the Response Boat. He was wearing a yellow inflatable life jacket, but he was face down in the water and unresponsive. While attempting to recover the person, the Response Boat Engineer was washed overboard and into the water. The other boat crewmember recovered the Response Boat Engineer, but they could not locate the person that fell from SEACOR POWER. None of the other vessels on scene heard any reports from Response Boat 45674 regarding the person in the water or the crewmember overboard.

8.10.131. At 2131, Bristow Helicopter 739 departed Galliano.[302]

8.10.132. At 2145, Response Boat 45674 departed the scene enroute Port Fourchon.[303]

8.10.133. At 2153, the two remaining personnel on SEACOR POWER called GLENN HARRIS on the radio and stated that they were seeking shelter inside the port side engine room doorway.[304] The Master of GLENN HARRIS stated that the individuals came out once or twice to talk on the radio, but the radio reception was not as good during those subsequent conversations.

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[298] Exhibit 17
[299] *Id.*
[300] Exhibit 177
[301] Exhibit 17
[302] Exhibit 177
[303] Exhibit 23
[304] Exhibit 17

8.10.134. At 2203, Bristow Helicopter 739 arrived back on scene with SEACOR POWER.[305] The Hoist Operator lowered the Rescue Swimmer again. The Rescue Swimmer stated that the vessel had settled further in the water and was about 15 feet lower than the previous rescue attempt. In addition, the winds had shifted about 10 degrees, and the waves were creating a large eddy where the water met SEACOR POWER. The waves were also crashing over the individuals on the vessel every 5 to 10 seconds. The helicopter was hovering 80 feet above the water, and there was sea spray hitting the helicopter.

8.10.135. At 2224, Coast Guard Helicopter 6506 took off from Air Station New Orleans.[306]

8.10.136. At 2228, GLENN HARRIS' crew attempted to contact the personnel remaining on SEACOR POWER via radio. There was no response.[307]

8.10.137. At 2243, Coast Guard Helicopter 6506 radioed Bristow Helicopter 739 to say that they were on their way to the scene, so the Bristow helicopter recovered the Rescue Swimmer. At 2245, Bristow Helicopter 739 departed to conduct a nearby search for the individual that fell in the water while the helicopter was refueling.[308]

8.10.138. At 2258, Coast Guard Helicopter 6506 arrived on scene. At 2312, the helicopter had 50-60 minutes of fuel remaining.[309] The air crew assessed the situation. They decided that it was too dangerous to lower their Rescue Swimmer and attempt a rescue of the individuals that were inside the hatch.

8.10.139. At 2319, Coast Guard Helicopter 6005 took off from Aviation Training Center Mobile.[310]

8.10.140. At 2327, Response Boat 45687 departed the scene. The crew had reached the maximum number of hours they were allowed to operate.[311] The Coxswain of 45687 stated that the seas continued to build that evening. By the time he departed the scene, he observed 12 to 14 foot seas, with occasional 16 foot seas.

8.10.141. At 2333, Coast Guard Fixed Wing Airplane 2316 took off from Aviation Training Center Mobile.[312]

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[305] *Id.*
[306] Exhibit 269
[307] Exhibit 17
[308] *Id.*
[309] *Id.*
[310] Exhibit 268
[311] Exhibit 17
[312] Exhibit 268

8.10.142. At 2346, Bristow Helicopter 739 returned to Galliano Airport.[313]

8.10.143. The Master of GLENN HARRIS was concerned about fatigue on his crew, since they were only scheduled to be underway for eight hours that day. He contacted Sector New Orleans and told them that they needed to return to port.

8.10.144. At 2351, GLENN HARRIS departed the scene.[314] GLENN HARRIS arrived in port around 0015 and first responders met them at the dock to assist Cardinal Worker 2.

8.10.145. At 2400, the crew of Offshore Supply Vessel CAPE COD recorded the weather at the location of the capsized SEACOR POWER. They observed rain, winds 40-50 knots, seas 10-12 feet, visibility 6-8 miles. They noted the position as 29º0.636'N, 090º12.00'W.[315]

8.10.146. On April 14 at 0008, Coast Guard Helicopter 6506 departed the scene and Coast Guard Helicopter 6005 arrived on scene.[316]

8.10.147. At 0016, Coast Guard Helicopter 6506 landed at Air Station New Orleans.[317]

8.10.148. At 0018, Coast Guard Fixed Wing Aircraft 2317 departed the scene and Coast Guard Fixed Wing Aircraft 2316 arrived on scene at 0022.[318]

8.10.149. At 0454, Coast Guard Helicopter 6005 departed the scene, and at 0458, Coast Guard Fixed Wing Aircraft 2316 departed the scene.[319]

8.10.150. At 0610, CGC BENJAMIN DAILEY departed their location in Port Isabel, TX (410 nautical miles southwest of Port Fourchon) to assist with the Search and Rescue efforts.[320]

8.10.151. The District Eight CDO stated that the next morning, the District requested support from aircraft in District Seven (60's and C130s) and from training aircraft at Aviation Training Center Mobile that are not usually used for search and rescue.

8.10.152. At 0653, Bristow Helicopter 739 departed Galliano.[321]

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[313] Exhibit 177
[314] Exhibit 17
[315] Exhibit 2
[316] Exhibit 23
[317] Exhibit 269
[318] Exhibit 23
[319] *Id.*
[320] Exhibit 241
[321] Exhibit 177

8.10.153. At 0700, Coast Guard Helicopter 6005 departed Aviation Training Center Mobile.[322]

8.10.154. At 0710, Bristow Helicopter 739 arrived back on scene with the SEACOR POWER.[323] The crew observed a liferaft next to the vessel.[324] The vessel had settled into the water, and the engine room hatch was underwater.

8.10.155. Bristow Helicopter 739 lowered their rescue swimmer into the water at 0723,[325] and the rescue swimmer searched for survivors on the SEACOR POWER and in the liferaft. He disconnected himself from the hoist cable. He entered the water and tried to feel inside the engine room hatch that was underwater, but did not find anyone. He did not find any survivors or any signs of life visually or as a response to banging on the hull.

8.10.156. At 0745, the helicopter recovered the rescue swimmer,[326] conducted a search pattern, and returned to Galliano at 0833.[327]

8.10.157. At 0755, the CAPE COD, with the SEACOR POWER First Mate aboard, departed the scene at 0755 in order to return to port.[328]

8.10.158. At 0800, the CGC AMBERJACK arrived on scene.[329]

8.10.159. At 0807, Coast Guard Fixed Wing Airplane 2305 took off from Aviation Training Center Mobile to conduct a search for the SEACOR POWER case. They returned to Mobile four hours later. At 1740, the aircraft took off again and conducted a seven and a half-hour flight.[330]

8.10.160. At 0825, Coast Guard Helicopter 6005 arrived on scene and commenced a search pattern.[331] At 0835, the crew located a body without a lifejacket in the water in position 28º59.09'N, 090º12.47'W (1.4 nautical miles south-southwest of the capsized vessel). The helicopter pilots notified CGC AMBERJACK, and the vessel proceeded to the location. At 0930, CGC AMBERJACK's crew recovered the body of the Master. [332]

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[322] Exhibit 268
[323] Exhibit 2
[324] Exhibit 179
[325] Exhibit 2
[326] Exhibit 2
[327] Exhibit 177
[328] Exhibit 2
[329] Exhibit 240
[330] Exhibit 268
[331] Exhibit 23
[332] Exhibit 240

8.10.161. At 0955, Coast Guard Helicopter 6506 took off from Air Station New Orleans. The aircraft conducted a flight for the SEACOR POWER case, and landed in Galliano at 1154. Due to bad weather, they waited there until 1520. The aircraft took off and conducted another flight for the SEACOR POWER case, and then landed back in Galliano at 1720.[333]

8.10.162. On April 15 at 0803, CGC BENJAMIN DAILEY assumed on scene coordinator and commenced search patterns.[334]

8.10.163. At 1758, CG helicopter 6005 located a body along the shoreline in position 29º02.652'N, 090º49.712'W.[335] At 1910, the CGC BENJAMIN DAILEY launched its small boat to recover the body. At 1938, the crew recovered the body of Cook 2.[336]

8.10.164. On April 16 at approximately 1445, divers contracted by Donjon-Smit detected the body of A/B 3 inside the capsized vessel. The body was located in and recovered from the portside engine room. The divers did not detect any air pockets inside the engine room.[337]

8.10.165. At approximately 1720, divers contracted by Donjon-Smit saw the body of Cook 1 surface unexpectedly behind the dive boat and they recovered the body. At 1935, SEACOR BRAVE transferred the bodies of A/B 3 and Cook 1 to shore.[338]

8.10.166. On April 18 at approximately 1930, divers contracted by Donjon-Smit discovered the body of the Assistant Chief Engineer in the starboard forward recreation area on level two. The divers recovered the body at 0115 on April 19 and SEACOR BRAVE took the body to shore.[339]

8.10.167. On April 19 at 1935, Sector New Orleans suspended the search for the missing individuals. A combination of Coast Guard aircraft, cutters and small boats searched a total of 9,290 square nautical miles.

8.10.168. On April 20 at 1145, divers contracted by Donjon-Smit discovered the body of Fugro Worker 2 in the portside engine room. The divers recovered the body at 1648 and took the body to shore.[340]

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[333] Exhibit 269
[334] Exhibit 23
[335] Exhibit 23
[336] Exhibit 241
[337] Exhibit 254
[338] *Id.*
[339] *Id.*
[340] *Id.*

8.10.169. The Chief Engineer, A/B 2, Galley Hand, Cardinal Worker 1, Fugro Worker 1, and Major Equipment Worker were not found and presumed dead as a result of the capsize.

8.10.170. After this incident, Bristow established a pre-made drop bag that they can lower to someone in distress. The bag contains flotation, a radio, and lights.

8.11 Salvage

8.11.1. The Coast Guard does not have specific statutory authority to direct salvage operations; however, several statues grant the Coast Guard authorities related to vessel salvage, including the Clean Water Act (33 USC 1321) and the Port and Waterways Safety Act (46 USC 70002). 33 CFR 6.04-6.08 also grants regulatory authorities over vessels and facilities in each Captain of the Port Zone, including the authority to control the movement of vessels.

8.11.2. Under the statutory authority granted by the Clean Water Act, the Coast Guard established Salvage and Marine Firefighting regulations in 33 CFR Part 155, "Oil or Hazardous Material Pollution Prevention Regulations for Vessels." These regulations broadly define salvage as "any act undertaken to assist a vessel in potential or actual danger, to prevent loss of life, damage or destruction of the vessel and release of its contents into the marine environment."

8.11.3. 33 CFR Part 155, Subparts I and J applied to SEACOR POWER and required a pre-negotiated contract with a salvage company. One of the services required of Salvage and Marine Firefighting providers was "diving services support." The regulations state, "Diving services support means divers and their equipment to support salvage operations. This support may include, but not be limited to, underwater repairs, welding, placing lifting slings, or performing damage assessments." The regulations list the response timeframe for diving services support in a nearshore area as 18 hours.

8.11.4. Seacor's pre-negotiated contract named Donjon-SMIT as the SMFF provider, as required by 33 CFR 155 Subpart J.[341]

8.11.5. At approximately 1730 on April 13th, the Donjon-SMIT Program Manager called the Seacor DPA and offered assistance. Approximately 30 minutes later, Donjon-SMIT confirmed they could provide a 6-man dive team, and they could arrive in Port Fourchon at midnight by charter plane. The DPA asked Donjon-SMIT to mobilize. Donjon-SMIT and the DPA confirmed that Seacor would provide a dive vessel.

8.11.6. Seacor initially setup an Incident Command Post remotely over Microsoft Teams and at Bollinger in Port Fourchon. Seacor's General Manager and DPA shared the role of

[341] Exhibit 103

Seacor Incident Commander. They were working with the LaFourche Parish Sheriff, Harbor Police, NRC pollution responders, and the Coast Guard. The Seacor DPA stated that, at approximately 1900, the Coast Guard Incident Command shifted from the Coast Guard CDO to the Coast Guard SAR Mission Coordinator, and later to the Sector Commander of Sector New Orleans.

8.11.7. Seacor asked Talos if they could provide divers. Talos offered to provide a dive barge and an anchor tug that were located in the Bay Marchand area. Talos said that they could be at SEACOR POWER's location in six hours. Once on scene, the vessels would require set-up of an anchor spread. Seacor did not request the dive barge.

8.11.8. Talos also offered the OSV ROMAN ELIE, a 180-foot DP1 vessel (dynamically positioned without redundancy), which was located in Port Fourchon and was on charter to Talos. Seacor accepted and ROMAN ELIE shifted position to Bollinger North.

8.11.9. Seacor mobilized the Platform Supply Vessel SEACOR BRAVE, a 200-foot DP2 vessel (dynamically positioned with redundancy), which was located in Morgan City. SEACOR BRAVE got underway at approximately 2000. Due to a malfunction with the swing bridge in Houma, SEACOR BRAVE had to reroute to get to Port Fourchon.

8.11.10. At 2300 on April 13th, three divers, two diver tenders, and a dive supervisor arrived at the Galliano Airport. At midnight, they arrived at the ROMAN ELIE in Port Fourchon. The dive team was from Phoenix Diving, and was contracted by Donjon-SMIT. A Salvage Master and Salvage Officer from Donjon-SMIT accompanied the dive team.[342]

8.11.11. The Talos Logistics Manager stated that the ROMAN ELIE was not used as a dive vessel because it was not DP2. At 0800 on April 14th, Seacor, Donjon-SMIT, and Phoenix Diving met with the owners of the OSV HARVEY EXPLORER (also noted as HARVEY PROVIDER in testimony) to discuss use of the vessel.[343]

8.11.12. At 1430 on April 14th, the Seacor Operations Manager informed Donjon-SMIT that Harvey Gulf's OSV would be replaced by the SEACOR BRAVE. SEACOR BRAVE was estimated to arrive in Port Fourchon at 1830.[344] Seacor's General Manager stated that the Harvey Gulf OSV had a marine gear problem and the vessel could not be used.

8.11.13. At 2000 on April 14th, the SEACOR BRAVE arrived in Port Fourchon to serve as the dive support/salvage vessel. Personnel from Donjon-SMIT and Phoenix Divers began loading their equipment on the vessel. An assistant dive supervisor, diver/tender, and an additional diver were added to the dive team.[345]

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[342] Exhibit 254
[343] *Id.*
[344] *Id.*
[345] *Id.*

8.11.14. At 0830 on April 15th, the Donjon-SMIT team finished loading SEACOR BRAVE and the vessel departed Port Fourchon enroute the SEACOR POWER site. A Coast Guard Marine Inspector and a Seacor Technical Superintendent were aboard SEACOR BRAVE. At 1130, SEACOR BRAVE arrived at the SEACOR POWER site to conduct dynamic positioning trials. There were several unsuccessful attempts to approach SEACOR POWER with an inflatable "Zodiac" dive boat launched from SEACOR BRAVE, but swells and rough seas prevented a safe approach.[346]

8.11.15. At 1600, on the fourth attempt, the dive boat was able to tie up to SEACOR POWER. A diver left the water surface at 1626. The diver installed downlines and hammered on the exterior galley walls of SEACOR POWER with no reply. The diver returned to the surface at 1725, and the dive boat and SEACOR BRAVE returned to Port Fourchon.[347]

8.11.16. On April 16th, the divers conducted a second dive on SEACOR POWER, starting at 0933. The diver closed the port side door on the second level and a porthole on the second level. Due to worsening weather, the diver surfaced at 0959 and the dive boat moved to the Belle Pass Jetties for shelter, while SEACOR BRAVE remained on site to monitor weather.

8.11.17. At 1315, the dive boat was back on site and the third dive on SEACOR POWER commenced at 1341.

8.11.18. At 1440, a diver detected the body of A/B 3 inside the capsized vessel. The body was located in and recovered from the portside engine room. The diver did not detect any air pockets inside the engine room.[348]

8.11.19. At 1720, diver tenders saw the body of Cook 1 surface unexpectedly behind the dive boat and recovered the body. Divers closed the portside doors on levels 1, 2, and 3, but could not close the door to the galley due to damaged hinges. The dive operations concluded at 1812. Three additional divers and two additional diver tenders were added to the dive team.[349]

8.11.20. Between 1941 and 2250, the bodies of A/B 3 and Cook 1 were transferred to shore.[350]

8.11.21. At 0100 on April 17th, both SEACOR BRAVE and the dive boat were at the SEACOR POWER site. Swells on site forced both vessels back to port at 0300.

8.11.22. At 0825, both SEACOR BRAVE and the dive boat were on site again. Divers left the surface at 0901 and 0908. Divers searched the wheelhouse, and level 3. On level 3, a diver reported "All interior walls and ceilings collapsed and broke apart." Weather on

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[346] *Id.*
[347] *Id.*
[348] *Id.*
[349] *Id.*
[350] *Id.*

site deteriorated and dive operations concluded at 1207. SEACOR BRAVE recorded 20 to 30 knot winds, 2.3 knots of current, and swell heights of 3 to 5 feet at 2249.

8.11.23. On the morning of April 18th, the dive boat had technical problems and was repaired at 1140. Once onsite, a diver left the surface at 1331 and divers completed a search of level 3 between 1354 and 1450.

8.11.24. At 1629, divers began searching level 2. At approximately 1930, divers discovered the body of the Assistant Chief Engineer in the starboard forward recreation area on level 2.

8.11.25. On April 19th, at 0115, divers recovered the body of the Assistant Chief Engineer. At 0445, the dive boat returned to Port Fourchon due to worsening weather. The dive boat returned to SEACOR POWER at 1537, and divers left the surface at 1711 and 1722. Divers searched level 2 and level 1, and dive operations concluded at 2221. Three additional divers were added to the dive team.[351]

8.11.26. On April 20th, the first diver left the surface at 0019 to search level 1. At 1141, divers started searching the port side engine room, and, at 1145, a diver discovered the body of Fugro Worker 2 in the portside engine room. The divers recovered the body at 1648. The engine control room was searched by divers. Dive operations concluded at 2321.[352]

8.11.27. On April 21st, divers searched level 1 and 2. Additional dive team members visited Liftboat SEACOR LEGACY for orientation purposes.[353]

8.11.28. From April 22nd to April 24th, weather prevented diving operations.[354]

8.11.29. On April 25th, divers searched level 2 and level 3 from 1520 to 2020. Divers searched the starboard engine room and attempted to close hydraulic valves from 2200 to 2250. Divers searched the port engine room and closed hydraulic valves from 2250 to 2400.

8.11.30. On April 27th, the Seacor General Manager stated that operations on site were transitioning to salvage. He was working with the Coast Guard Captain of the Port in Houma, and Seacor was providing personnel as part of the incident command system.[355]

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[351] *Id.*
[352] *Id.*
[353] *Id.*
[354] *Id.*
[355] Exhibit 273

9. Analysis

9.1 Incident

9.1.1. On the morning of April 13th, weather forecasts for coastal Louisiana predicted two to four foot seas, and 10 to 20 knot winds, which were within SEACOR POWER's operating limits and not a concern for SEACOR POWER's crew. Based on previous examples of bad weather situations, the Master would not have gotten underway on April 13th if he had any concerns about the weather that day. Given the information available to SEACOR POWER at the time of departure, it was not unusual, unreasonable, or unsafe for the vessel to get underway. Further analysis regarding the weather on April 13th is discussed in section 9.8 below.

9.1.2. A number of other vessels departed Port Fourchon around the same time as SEACOR POWER on April 13th, further demonstrating that it was not unusual or unreasonable for the vessel to get underway that day.

9.1.3. Based upon testimony from various individuals, the Master did not receive any pressure from Seacor, Talos, or the Company Man to get underway on April 13th.

9.1.4. Based on statements from the Off-Boat Master, the Off-Boat Chief Engineer, the First Mate and the Night Captain, along with phone calls and emails between Seacor and the Master, SEACOR POWER was operating properly on the date of the incident.

9.1.5. Vessels under contract with Talos normally tied up at the Talos dock, but SEACOR POWER was too large to fit there. As a result, SEACOR POWER was located at the Bollinger North dock on the morning of April 13th. The Offshore Workers boarding SEACOR POWER that day were supposed to check in at the Talos dock before going to Bollinger. However, only seven of the eight Offshore Workers (including the Company Man) checked in at Talos, which is likely the reason the Master's email to Seacor only listed seven Offshore Workers aboard the vessel that day. This is also part of the reason there was a delay in identifying the number of individuals after the vessel capsized.

9.1.6. The Master was required to prepare and send a list with the name of each person that embarked the vessel, but, on April 13th, the Master did not provide Seacor with a full list of names. He only provided names for the 11 Seacor crew, which likely also contributed to the inaccurate count of Offshore Workers and the post-capsizing delay in identifying the number of individuals.

9.1.7. SEACOR POWER's method of loading cargo by using a load cell on the crane to weigh each item, and then tracking the placement of each item, was an effective way to account for the loading of the ship. The records of cargo weight and placement on April 13th were lost in the incident.

9.1.8. SEACOR POWER's crew was not allowed to use the cranes or to shift cargo while the vessel was afloat, so all of the cargo and equipment loading occurred while the vessel was jacked up (with the legs down, the pads on the bottom, and the hull up and out of the water). This caused some issues with stability calculations, because the crew could not

accurately assess the vessel's draft while the boat was jacked up. Once the vessel was jacked down (with the legs up, the pads off the bottom, and the hull fully floating in the water), then they could use the draft readings to calculate the vessel's displacement and allowable vertical center of gravity (VCG). If there was an issue with excessive heel or trim, the vessel could not use the cranes while floating, so they would have had to jack the vessel back up in order to move things around. This created a disincentive to correct any stability problems, but due to the vessel's size and shape, and the fact that the cargo VCGs were always much lower than the leg VCGs, it is unlikely that there were many situations where the cargo loading caused a problem with the vessel's lightship or VCG.

9.1.9. SEACOR POWER's Marine Operations Manual contained a six-inch aft trim limitation on page 8-13. This trim limitation is in smaller print than the surrounding text and only appears on a worksheet form that can be used by the crew to calculate trim. The crew stated that they did not use this worksheet in the Marine Operations Manual to evaluate stability, they used a computer-based spreadsheet that was not recovered from the vessel. SEACOR POWER departed Port Fourchon with approximately 2.5 feet of aft trim on April 13th, which was not in accordance with the trim limitation on page 8-13 of the Marine Operations Manual.

9.1.10. SEACOR POWER's Cargo Securing and Marine Operations Manuals provided conflicting guidance regarding cargo securing. One of the documents stated that cargo shall be secured, and the other one said that cargo did not have to be secured in certain situations. On April 13th, the crew did not secure the cargo to the deck of SEACOR POWER, and, based upon hearing testimony, this was a common practice due to the fact that the vessel did not roll very much while underway, and friction was capable of holding the cargo on deck (as noted in the cargo securing manual). The lack of cargo securing was not identified as a causal factor in the vessel's capsizing, however it was an unsafe condition, and it is important to secure cargo anytime a vessel is underway.

9.1.11. The First Mate made an announcement prior to jacking down, and stated that all personnel must remain inside while the vessel was underway. This was a normal practice on SEACOR POWER, and that was likely due to the fact that the vessel had a low freeboard and commonly took water on deck from seas, swells, or rolling.

9.1.12. SEACOR POWER encountered the first squall at 1519, and the First Mate observed the wind speeds jump up to 79 mph. The vessel's speed increased from 2.5 knots to 5.5 knots, which was slightly above their normal speed of 4 to 5 knots. The First Mate stated that he and the Master discussed whether the wind would lay down the seas, but he did not indicate that either one of them were concerned about the winds, even though the wind speeds exceeded their operating limits at that point. The First Mate did not say they discussed lowering the legs during the first squall, which was likely due to several factors. First, they probably thought that the conditions were just a short burst of wind that would not last. Second, they knew the vessel would not steer in winds over 35 or 40 knots. Third, they were moving fast, and they usually liked to have zero speed when they were soft-tagging. Fourth, they typically called Fugro to find a safe location before putting their pads on the bottom. In these types of unusual, but risky, situations, emergency procedures for unexpected weather conditions could provide vessel crew's with critical guidance to help them respond to the situation.

9.1.13. SEACOR POWER encountered the second squall at 1532, and the First Mate observed white-out conditions, reducing visibility to approximately 100 yards. The vessel's speed increased from 6 to 8.5 knots, which was much faster than their normal speed. The First Mate stated that he recommended soft tagging due to reduced visibility and the amount of traffic and platforms in the area. He did not say he recommended soft tagging due to the speed of the wind, even though the winds were higher than they were in the first squall.

9.1.14. After making the decision to soft tag, the First Mate turned SEACOR POWER to port in an attempt to slow the vessel's speed. After the turn, the vessel started listing, and the Master attempted to turn the vessel back to starboard. The AIS data did not show any significant turn at that point, so either the Master did not have time to make the turn, or the vessel did not respond to the turn. Due to the fact that the vessel never turned back to starboard, it is unlikely that the attempt to turn contributed to the capsizing.

9.1.15. After SEACOR POWER turned to port, the First Mate observed more than 2 degrees of starboard list. Based on the Marine Safety Center's stability analysis, at a 3 degree list, the starboard side deck edge of SEACOR POWER would be at the waterline with waves cresting on deck. With 4 foot waves, the crests would be 2 feet over the deck edge. Based on the AIS heading and speed information, SEACOR POWER was moving sideways through the water just prior to the capsizing, which would have created leading edge waves along the starboard side of the vessel, increasing the amount of water on deck. These factors likely pushed water levels above the starboard side door sill to the galley, which is why the Cook reported water coming in prior to the capsizing.

9.1.16. Immediately prior to the capsizing, the First Mate observed a 5 degree list. At that angle, part of SEACOR POWER's main deck would be submerged, as noted in the figure below. If any doors or vents on the starboard side of the main deck were open, this would have caused downflooding. There was no evidence to indicate that downflooding was a causal factor in the capsizing.

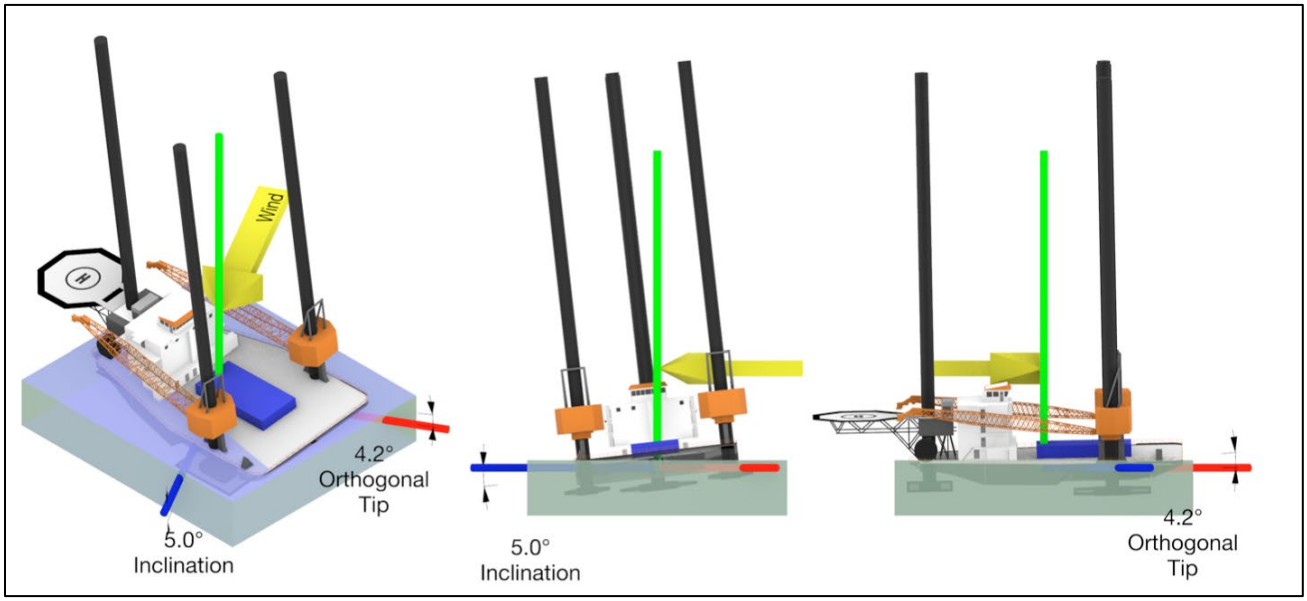

Figure 52: Sketch of SEACOR POWER inclined 5° in still-water from wind at 240° relative (Exhibit 246)

9.1.17. Based on the typical speed of lowering SEACOR POWER's legs (about five feet per minute), and the fact that after the casualty, the pads were found about 10 feet from the pad pockets, the First Mate and the Captain collectively lowered the vessel's legs for two minutes before the vessel capsized.

9.1.18. Immediately prior to capsizing, the Master and the First Mate took action to warn the individuals aboard the vessel. The survivors stated that they heard the Master's announcement to get their lifejackets, and some of the survivors stated that they heard the tilt alarm (activated by the First Mate). Although the Master and the First Mate took immediate action, the capsizing occurred so quickly that there was virtually no time for any lifesaving actions prior to the roll. The individuals who were asleep likely did not have any warning before they were forced to take instantaneous action to survive.

9.1.19. In addition to the speed of SEACOR POWER's capsizing, the crew's actions to survive were also hampered by the widespread movement of furniture and equipment during the capsizing. Many items on the vessel were not properly secured, and this was due to the fact that the vessel did not typically roll very much while underway, and the vessel normally operated in seas less than five feet.

9.1.20. The only required watertight volume of SEACOR POWER was the hull. The doors to the engine room were therefore the only required watertight doors. The superstructure was not watertight, and, as a result, it filled up with water very quickly after capsizing.

9.1.21. The Coast Guard Search and Rescue (SAR) Addendum divides a SAR case into five stages to help organize response activities. The stages include Awareness, Initial Action, Planning, Operations, and Conclusion, and can be performed simultaneously. During the SEACOR POWER SAR case, there were a number of issues that slowed down the Coast Guard's awareness of the incident. However, once the Coast Guard was alerted to the vessel's capsizing, they performed the remaining SAR stages efficiently and effectively, given the operational constraints of weather-limited response resources. Further analysis regarding the Awareness stage for the SEACOR POWER case is discussed in section 9.10 below.

9.1.22. The Sector New Orleans Command Center was alerted to the SEACOR POWER incident by a VHF distress call from the ROCKFISH. After receiving the distress call, the Command Center immediately took initial action and issued an Urgent Marine Information Broadcast (UMIB). The UMIB got the attention of a number of mariners and prompted them to respond to the incident. The quick reactions of Good Samaritans saved the lives of multiple individuals that day.

9.1.23. After the Sector Command Center issued the UMIB, they asked the District Eight Command Center to launch Coast Guard helicopters and planes, but the aircraft in New Orleans and Mobile (the two closest Air Stations) were grounded due to lightning and bad weather. A helicopter from Houston could have taken off, but they would have needed to land and refuel after arriving in the area, and the Command Center was concerned they would have no place to land. The Command Center launched a plane from Corpus Christi, which arrived on scene, dropped Self Locating Data Marker Buoys (SLDMBs) and assisted with the search. The Command Center continued to check in

with the two close Air Stations, and when the lightning and weather cleared, they launched helicopters from both locations.

9.1.24. Once Sector New Orleans learned that the helicopters in New Orleans and Mobile were grounded, they assessed the other available Coast Guard assets. The closest small boats were located at Station Grand Isle, but the crew was still assessing the damage they received from the bad weather, and the wind speeds reported offshore at the time exceeded the operating capabilities of the boats. As stated in the SAR Addendum, small boats and aircraft are not expected to survive, much less perform a rescue, when wind and sea conditions are beyond the limitations of the hull, airframe or the humans that operate them. However, after carefully assessing the situation and weighing the risks, the Sector asked Station Grand Isle if they could launch a small boat. The crew at the Station agreed to get underway. The Station was only required to have one boat ready to launch, but they were able to launch two boats.

9.1.25. One of the Good Samaritan vessels that immediately responded to the UMIB was GLENN HARRIS. The vessel was scheduled to be commissioned as a Coast Guard Cutter, but that had not yet occurred, and the vessel was operated by a Bollinger Shipyard Captain and crew. The future Coast Guard crew was aboard in a training capacity. While the pre-commissioned status of the vessel did cause some confusion at the District and Sector Command Centers, this did not slow down the vessel's response or their arrival on scene. When GLENN HARRIS arrived at the SEACOR POWER site, they observed five individuals clinging to the superstructure that was above the water. GLENN HARRIS launched their small boat to attempt a rescue, but heartbreakingly, the wind, waves, and hazards from the SEACOR POWER superstructure prevented the small boat from getting close enough to recover the individuals. After this rescue attempt, the waves continued to grow throughout the evening, and conditions continued to worsen for the remaining individuals.

9.1.26. A civilian medivac helicopter from Bristow, equipped with hoisting capabilities, also assisted with SAR efforts. The flight crew made several attempts to rescue the individuals remaining on the hull, but due to the angle of the vessel, and the fact that the individuals were under a hand rail, the Rescue Swimmer could not reach them. The flight crew successfully lowered lifejackets and a radio to the remaining individuals, which provided a valuable method of communication.

9.1.27. When the two Station Grand Isle Response Boats arrived on scene, they took positions as close to SEACOR POWER as possible. Response Boat 45687 successfully recovered A/B 1 after he entered the water (the crew was wearing heavy weather harnesses). Response Boat 45674 attempted to recover an unresponsive individual who entered the water, but one of the crewmembers washed overboard during the attempt. The crew on Response Boat 45674 was not wearing heavy weather harnesses. If they had been wearing harnesses, this likely would have prevented the crewmember from getting washed overboard, and may have allowed them to recover the unresponsive individual.

9.1.28. Multiple responders from GLENN HARRIS, the Coast Guard Response Boats, and the Bristow Helicopter testified that the only solution to recover individuals remaining on SEACOR POWER was for the individuals to enter the water and swim away from the

vessel. A/B 1 entered the water voluntarily and was recovered by Response Boat 45687, but he was seriously injured in the process, which justified the fears of the remaining personnel that did not voluntarily enter the water. It was reasonable for the individuals aboard SEACOR POWER to think that staying with the grounded, capsized vessel and waiting for the weather to subside was safer than entering the water. However, the vessel continued to sink into the mud and the weather did not subside.

9.1.29. Another Good Samaritan vessel that responded to the UMIB was CHRISTIAN CHOUEST. Once the vessel located the Night Captain, the crew determined that he could not swim to the vessel or climb aboard. Despite the bad weather conditions, the vessel's Chief Engineer jumped in the water to save the Night Captain. The Coast Guard should recognize the Chief Engineer's heroic actions on April 13th.

9.1.30. Later in the evening, there were only two individuals remaining on SEACOR POWER, and these two decided to enter the engine room door in order to find shelter from the waves and winds. At this point, the individuals were likely suffering from hypothermia and having trouble hanging onto the vessel, which explains their decision to enter the engine room. Unfortunately, this decision interrupted the communications with the individuals. As the vessel continued to sink, they were likely trapped in the engine room.

9.1.31. Based on multiple reports from Coast Guard assets, Good Samaritans, and the diving team, the winds, seas and currents were strong for much of the next week, which hampered search and rescue and diving efforts.

9.2 Company Organization and Operations:

9.2.1. Based on a Seacor DOC audit, a SEACOR POWER SMC audit, Seacor Master's reviews, incident notifications, and evidence of stop work authority, the company's SMS appeared to be working properly and compliant with the ISM Code.

9.2.2. The Seacor individuals involved in overseeing and managing SEACOR POWER had significant experience working in the offshore industry, but not many of these individuals had experience as a master or mate.

9.2.3. The Seacor Operations Manager was responsible for conducting officer appraisals, but he did not have underway experience as a master or mate. The Seacor SMS outlined a long list of responsibilities for the Master, and the Operations Manager relied heavily on the Master to fulfill all of these responsibilities. The Operations Manager did not have the experience to provide extensive support to the Master in the areas of navigation or onboard operations.

9.2.4. On the date of the incident, the Seacor Dispatcher's actions delayed the response to SEACOR POWER's EPIRB alert. However, the company's SMS did not include procedures for a Dispatcher to respond to an EPIRB alert.

9.2.5. Based on the last customer satisfaction survey, Talos was happy with the services provided by Seacor, and SEACOR POWER's Master exceeded their expectations.

9.3 Vessel History and Condition:

9.3.1. Based on the recent Coast Guard inspection, ABS surveys, internal Seacor audit pictures, and some of the crew's testimony, SEACOR POWER was in good condition, was well maintained, and was in compliance with both U.S.(CFR) and International(SOLAS) regulations. There was some damage to the vessel on April 10th, but the damage was repaired before the vessel departed on April 13th. There was no evidence that the vessel's condition or equipment was unsafe or was not properly operating at the time of the incident.

9.4 Stability Requirements and Vessel Stability

9.4.1. During construction, SEMCO provided ABS with a stability analysis for SEACOR POWER that considered only even (zero) trim. ABS approved the stability of SEACOR POWER with zero trim, but did not include any statement on stability letters to the operators or plan review letters to the designer that trim must be limited. The trim limit on page 8-13 of the Marine Operations Manual is not included in appropriate and more prominent locations of the manual that were actually used by the crew. For example, the following sections of the Marine Operations Manual do not include aft trim limits: "4.1.1 Drafts and Displacement," "4.2.2 Operating Limits in Afloat Mode," "5.2 Loading and Securing Cargo," "5.3 Monitoring Stability and Cargo Underway," "5.6 Afloat Stability Calculations," or "8.5 Stability Afloat."

9.4.2. For intact stability, the regulatory criteria wind speeds contained in the CFRs and the class standards contained in ABS MODU Rules do not represent actual real-world conditions. Regulatory wind speeds (70-knots and 60-knots) are used as limiting wind speeds for the operation of SEACOR POWER in the COI and in the Marine Operations Manual. 46 CFR 134.170 requires the operating manual to have "design" limits that include waves and wind and can be clearly understood by the crew. The impact on the vessel of 60 and 70-knot winds in still-water with no waves cannot be clearly understood as an operating limit. The Off-Boat Master and First Mate had a clear understanding of SEACOR POWER's 5-foot wave height limit (a design limit imposed in the Operating Manual) but they did not consider the 70-knot wind to be a reasonable limit.

9.4.3. SEACOR POWER's COI contains an endorsement that required the vessel to "proceed to a harbor of safe refuge or elevate at a location where it can survive 100 knots of wind when the 12 hour weather forecast predicts sustained winds in excess of sixty knots." The definition of restricted service is "service in areas within 12 hours of a harbor of safe refuge where a liftboat may be jacked up to meet the 100-knot-wind severe storm criteria of 46 CFR 174.255(c)." The regulatory definition is inclusive of gusting winds, while the the COI statement pertains only to slower sustained winds. The Marine Operations

Manual for SEACOR POWER does contain the statement on the COI or the definition of restricted service from the regulations.

9.4.4. The "shape coefficients" prescribed in Table 46 CFR 174.055(b) representing the force of the wind on different shaped components were examined in a technical paper written by ABS and GustoMSC in 2019. This paper demonstrates that the drag coefficients for cylinders with racks (the teeth used on the liftboat jacking system) are listed in the regulations as 0.5, but could actually be 4 times greater than that.[356] The cylindrical legs of SEACOR POWER substantially contributed to the wind profile of the vessel, especially at greater heights from the waterline where the wind speed is faster. Because the regulations used a smaller shape factor than is reasonable, the regulatory calculation may have underrepresented the wind load on SEACOR POWER.

9.4.5. MSC conducted a post-casualty stability analysis using the ABS draft and VCG table, five different trim scenarios, and an assumed departure condition for April 13th. This analysis demonstrated that SEACOR POWER met the ABS MODU Rule intact stability requirements in each of those scenarios. However, MSC's analysis indicated that several conditions fail to fully meet 46 CFR 174 criteria due to fading stability or capsize in the direction orthogonal to the wind direction. This is primarily due to the 46 CFR 174.255(a)(ii) range of stability criteria which ABS MODU Rules does not have.

9.4.6. For liftboats, vessel stability in a combination of fore and aft, and port to starboard, directions typically presents the weakest righting characteristics and increased wind profile area. The regulations do not address the direction of the wind and inclination for liftboat stability calculations. Critical axis is often used to describe the direction where the vessel is least stable, but that term is not defined or used in the regulations or in Coast Guard policy.

9.4.7. At SEACOR POWER's approximate 9.25 foot departure draft on April 13, the vessel's allowable normal operating vertical center of gravity was 44.75 feet (using the ABS approved VCG curve in the Marine Operations Manual on page 8-25). The allowable storm survival vertical center of gravity was 42.5 feet. The MSC Post-Casualty Sinking Analysis estimated the departure vertical center of gravity of SEACOR POWER was 39.04 feet, which was within the Marine Operations Manual stability guidance (with the exception of the Marine Operations Manual's six inch trim limitation) for both normal operating and storm survival conditions. MSC analysis confirmed that the departure condition met the applicable stability regulations.

9.4.8. For restricted liftboats, 46 CFR 174.255(a)(1)(i) requires the vessel to have 40% more area under the righting arm curve compared to the heeling arm curve; the "k" factor ratio between the two must be greater than 1.4, which was described as a safety factor built into the regulations for liftboats. This safety factor accounts for the effects of waves and unknowns resulting from the simplified wind force calculation methods described in regulation. A safety factor of 1.4, as related to wind speed in still-water conditions may

[356] Exhibit 246

not be a suitable design standard. Wind force is related to the wind speed squared. This means that a liftboat that narrowly passes the regulatory criteria for a 70 knot wind, could capsize with 83 knots of wind (in still water conditions) and satisfy the 1.4 factor of safety.

9.4.9. Regulatory and Class stability analyses do not evaluate the time it takes for liftboats to capsize. Due to the shape of the vessel, SEACOR POWER satisfied stability regulations but capsized very quickly and at an inclination angle much lower than normal vessels (between 10 and 20 degrees). SEACOR POWER capsized much faster than the activation time for most lifesaving or distress signaling devices.

9.5 Crew Training and Experience:

9.5.1. SEACOR POWER's Master and First Mate made the decision to get underway on the day of the incident. They both had significant relevant experience aboard SEACOR POWER, aboard other liftboats, in the Gulf of Mexico, and in the maritime industry. The Master had a good reputation for safety, both at work and at home.

9.5.2. SEACOR POWER's crew had the required Merchant Mariner Credentials and training for their assigned positions, and their company evaluations stated that they were all meeting expectations.

9.5.3. A number of the survivors, both crew and Offshore Workers, stated that they recently completed some type of survival training, and that training helped them survive after SEACOR POWER's capsizing.

9.6 Post Casualty Testing

9.6.1. The Master and the First Mate, who were operating the vessel at the time of the incident, were not under the influence of alcohol or drugs.

9.6.2. The Night Captain was not operating the vessel at the time of the incident, and he was not under the influence of alcohol or drugs.

9.6.3. Based on the post-mortem toxicology analyses and an assessment by the Lafourche Parish Coroner, the Assistant Chief Engineer, A/B 3, Cook 1, Cook 2, and Fugro Worker 2 were not under the influence of alcohol or drugs at the time of the incident.

9.7 Vessel Operations

9.7.1. Based on recent ABS surveys, internal Seacor audit pictures, an incident report form, mater's review forms, unsafe condition forms, and hearing testimony, SEACOR POWER was properly implementing their Safety Management System (SMS).

9.7.2. SEACOR POWER and many other liftboats are limited by a five foot sea state, and this type of sea state will typically form when the winds are well below a liftboat's wind limits. As a result, liftboats will jack up or come into port due to the sea state, and these types of vessels very rarely operate in wind conditions that are close to their upper bound.

9.7.3. After SEACOR POWER capsized, none of the survivors stated that they saw any emergency lights. SEACOR POWER's lighting was connected to the emergency generator. If the main source of power went out, the emergency generator would automatically kick on and provide power to the lighting system. Due to the fact that the emergency generator started in less than 45 seconds, the vessel was not required to have a transitional source of electrical power for the lighting system. In addition to the emergency generator, SEACOR POWER also had a couple of battery powered lights in the passageways, but there were not many of them, they were dim, and they were not required by regulation. During the incident, the vessel capsized quickly, causing the main source of power to stop working and preventing the emergency generator from starting. With no source of transitional power, a few battery power lights were available to assist the crew and offshore workers escape, but they did not sufficiently light the passageways. For vessels that carry offshore workers who may not be familiar with vessel arrangements, a transitional source of electrical power for the lighting system could facilitate quicker escape in an emergency situation.

9.8 Weather Conditions, Weather Reporting and Weather Equipment

9.8.1. On the morning of April 13th, weather forecasts for coastal Louisiana predicted two to four foot seas, and 10 to 20 knot winds. These were the forecasts that the SEACOR POWER Master and First Mate received and used for voyage planning. The First Mate did not see any other forecasts that day. The vessel's SMS stated the Master should monitor the weather every eight hours, so he should have checked another forecast before 1500 that day. He had access to Buoy Weather on the ship's computer, but that was not located on the bridge, so the First Mate did not know if he checked the program that day.

9.8.2. On April 13th, the National Weather Service (NWS) was tracking a line of severe weather, which started near Baton Rouge, and moved over the New Orleans region around lunchtime. The New Orleans/Baton Rouge NWS office began issuing Special Marine Warnings (SMWs) just after noon, but the first four SMWs did not apply to SEACOR POWER's location or planned trackline. Around 1400, the line of severe weather developed into a wake low and began accelerating to the south. The NWS issued another SMW at 1457, which warned mariners of severe thunderstorms moving southeast at 25 knots. The forecast predicted wind gusts of 34 knots or greater and large hail in the area where SEACOR POWER was operating.

9.8.3. The Master and First Mate never received the SMW that was issued at 1457, but even if they had received it, it is very unlikely that they would have stopped to jack up (lower the legs down and pick the hull up out of the water) or soft tag (rest the pads on the bottom). At the time of the warning, the vessel was transiting an area full of rigs and underwater pipelines, which would have made it difficult to find a safe location to put the liftboat

pads on the bottom. Additionally, the SMW predicted wind gusts of 34 knots or greater, which likely would not raise any alarms with the crew. In the Gulf of Mexico, mariners are used to seeing storms or fronts that move through with a strong burst of wind (around 30 to 35 knots) that quickly dies down. A forecast that says wind gusts of 34 knots or greater could mean one gust of 35 knots, or it could mean multiple gusts of 50 knots. These are very different situations, so there may be an opportunity to consider issuing SMWs that contain a range of expected winds, rather than just a lower limit.

9.8.4. Tragically, the weather that actually hit Port Fourchon and SEACOR POWER that day was moving faster and was far worse than what was predicted in the SMW at 1457. Multiple cameras in Port Fourchon recorded the arrival of two squalls that afternoon. The second squall arrived at the cameras on the northern docks in Port Fourchon at 1521, and arrived at the camera on the middle docks at 1522. These docks were approximately one nautical mile apart, which means the storm moved through Port Fourchon at 60 knots. Based the First Mate's testimony and the vessel's AIS data, the first squall hit SEACOR POWER at 1519 and the second squall hit at 1532. The SEACOR POWER was 7 nautical miles from the camera in Port Fourchon, which means the second squall moved offshore at a speed of approximately 42 knots. The winds that hit SEACOR POWER and the immediate surrounding areas that afternoon exceeded 80 knots and gusted up to 99 knots (measured at a 10 meter height).

9.8.5. The strength and duration of the severe weather that hit SEACOR POWER caught many people off-guard, including, but not limited to, the SEACOR POWER crew, the NWS, the very experienced Masters on ROCKFISH and GLENN HARRIS, and the Coast Guard personnel at Station Grand Isle. Numerous individuals stated that this was the worst weather they had ever seen in their careers.

9.8.6. For long duration weather events or conditions, there is generally some lead time to allow a mariner to receive the report and then prepare for forecasted conditions. However, for short duration weather events or conditions, there may not be much advance warning or time to prepare. One of the methods of checking weather on SEACOR POWER was the use of a buoy weather website on the computer, but there was no computer located on the bridge, so the crew did not have immediate access to this source. Vessel owners and operators need to ensure that they are equipping vessels with multiple methods of checking weather, in order to ensure mariners quickly receive important or time critical weather warnings. Weather is constantly changing, so a vessel's crew needs to ensure that they are regularly checking weather while they are underway. This is especially important for liftboats in restricted service, or other types of vessels that are limited by weather conditions. On the day of the incident, the crew on SEACOR POWER received a weather forecast from the company in the morning, but no one reported re-checking the forecast later that day. Recognizing that vessel crews are often very busy while underway, there may be opportunities for vessel owners and operators to implement procedures to check weather on a regular basis, or to assist with weather monitoring and providing weather updates to the crew.

9.8.7. It is important for a vessel to have continuous access to products designed for short duration weather forecasts, which is primarily the NWS Speical Marine Warnings (SMWs) for marine zones. There are a variety of ways for mariners to receive SMWs,

but most of these systems are set up so that a mariner has to look for a weather product from one of these sources, and the warnings will not just automatically come to them. In the case of SEACOR POWER, the crew would have to shift one of their VHF radios to hear NOAA weather forecasts, go down below to check the NWS website on one of the ship's computers, or leave the operating station and move to another part of the bridge to look at NAVTEX or INMARSAT. If the crew did not already know a weather system was coming, then there would be nothing to prompt them to check for a SMW. This highlights the need to explore new opportunities to push SMWs to mariners, including the possibility of using the Emergency Alert System (EAS) for SMWs, similar to the way Severe Thunderstorm Warnings (the equivalent of a SMW on land) or Tornado Warnings are automatically pushed to all cell phones in a predicted impact area. Cell phone use has become more and more popular for mariners operating close to shore, and this may provide a new way to distribute information about short duration weather events to only those individuals that are located in the impacted area. This is preferable to having a mariner search through various warnings for the ones that apply to them.

9.8.8. The NWS website, the Coast Guard NAVCEN website, and Coast Guard policy all state that the Coast Guard will broadcast weather over VHF radio, but on the date of the incident, no one reported hearing any of those broadcasts. Mariners still rely on Coast Guard VHF weather broadcasts, and, as discussed in the paragraph above, it is extremely valuable to have systems that are designed to push urgent weather information out to mariners. One of the Coast Guard policies that addresses weather broadcasts is more than 30 years old. It contains valuable information, but it needs to be updated.

9.8.9. The Coast Guard currently uses NAVTEX to broadcast weather forecasts and warnings to ships operating between 40 miles and 200 miles offshore, but evidence indicates that this system is not efficient or effective. The system does not provide full coverage (it does not broadcast to the western Gulf of Mexico), there is a very long chain of steps to get a weather product from the NWS and out to a ship's NAVTEX receiver (increasing the number of possible failure points), one link in the chain relies on commercial internet service (which could be susceptible to bad weather), messages describe a warning area through latitude and longitude coordinates (making it difficult to identify impact areas), NAVTEX receivers have small screens (making it hard to read the messages), NAVTEX receivers may not be close to a vessel's operating station (reducing the usage while underway), and ships may receive warnings for a very large area (making it harder to identify applicable messages).

9.8.10. Due to an internet outage on the date of the incident, the Coast Guard did not send any NAVTEX broadcasts from the New Orleans radio site between 1000 and 1623. However, for the reasons discussed in the paragraph above, it is very likely that SEACOR POWER's crew would not have looked at or used NAVTEX broadcasts that day, even if they were sent out and received on the vessel.

9.8.11. SEACOR POWER could also receive weather warnings through INMARSAT. The First Mate heard a GMDSS alarm on the bridge around 1430 on April 13th. This alarm was likely some type of INMARSAT warning, but the First Mate decided to ignore it. This probably means that the vessel's INMARSAT was providing warnings for a large area,

and it was not programmed to only provide warnings for the specific area where they were operating.

9.8.12. The NWS relies on real time weather observations from automated equipment to assist with forecasting, particularly in areas that are located far from a NWS radar, like Port Fourchon and coastal Louisiana. The NWS cannot see what is happening close to the surface in these areas, so they have to use the radar picture from higher levels and make assumptions to interpret what is occurring down below. Automated weather reporting can provide valuable information to assist the NWS forecasters in verifying their assumptions about what higher altitude radar images indicate at the surface. The NWS used to have access to automated information from several sites in and around Port Fourchon, but those are no longer active and are sorely missed. On the day of the incident, the NWS knew there was a system moving through Port Fourchon and offshore, but they could not "see" what was happening close to the surface. Since they did not have information to validate what was happening in real time, the forecasters predicted the most reasonable conditions they felt would occur, but the forecast did not reflect the actual conditions that afternoon. With more than 15,000 individuals flying offshore to work in the Gulf of Mexico each month, accurate weather forecasting for this region is extremely critical.

9.8.13. The NWS also relies on voluntary weather reports to assist with forecasting, because the weather that is getting reported is moving towards another location. Real time observations may not help the individual making the report, but it can help the NWS warn other people about a weather system before they experience it. There are a number of different programs for voluntary weather reporting, but there is no incentive for commercial ships to share weather reports. Today, many vessels are equipped with systems that send data directly to shore on a minute by minute basis, yet the New Orleans/Baton Rouge NWS office rarely receives ship observations. There could be a number of different opportunities to identify existing data systems that could be used to automatically send weather observation information to the NWS.

9.8.14. The CG-NWS MOA and Coast Guard policy state that Coast Guard Cutters and Stations will send weather observations to the NWS, but the New Orleans/Baton Rouge NWS office does not appear to be getting this type of information on a regular basis, especially for the Port Fouchon and coastal Louisiana areas. The Coast Guard policies related to this topic contain valuable information, but they are old and need to be updated to reflect current Coast Guard organization and technology.

9.9 Lifesaving and Distress Signaling Equipment

9.9.1. The lifesaving arrangements appeared to be designed for when the vessel was jacked up, not necessarily for while the vessel was underway. There were lifejackets that were tied up in a box on deck. The liferafts were positioned on the main deck, which sometimes took on water while they were underway (due to waves). The liferafts were also positioned under the cranes, so they may not have been fully float free. While the lifesaving arrangements were not ideal for underway conditions, they did not appear to

contribute to the casualty because the vessel capsized so quickly and there was no time for the crew to access or deploy the lifesaving equipment.

9.9.2. The evidence indicates that SEACOR POWER's SART was not an effective piece of lifesaving equipment during this incident. There was no pole to position the SART above the water, no one detected the SART during Search and Rescue activities, and post casualty testing revealed that SARTs will not always display on a vessel's radar, depending on the range and gain settings.

9.9.3. Cook 2's cause of death was hypothermia. He was found in a life jacket and was not found inside the vessel. The water temperatures in the Gulf of Mexico can drop below 70 degrees in the winter and spring. Since water conducts heat away from the body much faster than air, water temperatures below 70 degrees can significantly reduce a person's survival times, despite the warmer air temperatures in the area. However, vessels operating solely in the Gulf of Mexico are exempt from the regulatory requirement to carry immersion suits for each person aboard the vessel. In this case, a properly-donned immersion suit could have increased Cook 2's survivability time.

9.9.4. Several individuals testified at the hearing about the benefits of using or requiring PLBs. If a survivor floating in the water has a PLB with them, then they could be located and rescued quicker. However, the D8 CDO also testified that the Coast Guard received a large number of EPIRB alerts and distress calls on April 13th, and the large number of alerts delayed response actions. Given the large number of false alerts already associated with EPIRBs, the addition of distress beacons for each individual person or lifejacket would likely create an overwhelming amount of signals to triage. Personal, and non-required, use of PLBs is likely a best practice for mariners, but only if the mariner is willing to properly register and regularly update their device registration.

9.9.5. SEACOR POWER did not release a VHF radio MAYDAY call, or an INMARSAT or DSC distress call, before it capsized. Any of these calls could have significantly reduced the response time for Search and Rescue. The First Mate stated that he pressed a GMDSS alert button (likely the INMARSAT) after the vessel capsized, but this signal was never received. The only GMDSS signal that made it ashore was from the EPIRB, which was not manually operated. Despite the large amount of various distress systems on the bridge, none of the manually operated systems assisted with the response, so there may be an opportunity to simplify the process to activate distress equipment on the bridge.

9.9.6. The First Mate stated during testimony that his knife saved his life. This personal preparedness may be best addressed as a company policy, along with other forms of personal lifesaving equipment, including flashlights and reflective clothing.

9.10 Search and Rescue:

9.10.1. There were a number of technological issues that made it difficult for the Coast Guard District Eight Command Center to triage and respond to SEACOR POWER's EPIRB.

The District Command Center receives EPIRBs through SARSAT, which is a program on their computer. The SARSAT program is separate from the CG One View program, which is where the watchstanders can view locations of a distressed vessel, good Samaritans and Coast Guard assets. They cannot view all of this critical information in one common operating picture. Additionally, each time the watchstanders open a separate computer program, their computers slow down. As a result, the watchstanders could not quickly verify that SEACOR POWER was underway or in distress. When they called the Seacor Dispatcher after receiving an EPIRB alert, they did not have their own location information to validate the Dispatcher's statement that the vessel was at the dock. These factors slowed down the Coast Guard's response.

9.10.2. In addition to the issues mentioned in the paragraph above, the Sector Command Center doesn't receive EPIRB alerts directly, even though they are equipped with VHF radio to talk with vessels (and the District Command Center is not), and they control many of the assets that respond to EPIRB alerts. The District can share EPIRB locations with the Sector over the phone, but this is a time consuming and inefficient process, especially when both units are handling multiple SAR cases. On the date of the incident, the Sector Command Center phones were not working well, which further inhibited the exchange of information. The Sector Command Center is a secure space, so the watchstanders did not have the option of using cellular phones as a backup for phone or internet connections.

9.10.3. On the date of the incident, the District Eight Command Center watchstander received an unlocated EPIRB alert from SEACOR POWER, and initiated phone calls and response actions based upon that unlocated alert. Another EPIRB alert from SEACOR POWER came in two minutes later, which included the accurate position of the vessel at sea, but the watchstander did not see it because he was already taking action. Several factors affected the member's failure to check back for a second EPIRB alert, including the policy of taking immediate action on EPIRB alerts, the policy that does not give precedence to MEOSAR alerts, the fact that the system requires the watchstander to acknowledge every single alert, and the overwhelming number of EPIRB alerts coming in that day. If the watchstander would have seen the second alert before or during the call with the Seacor Dispatcher, they could have confirmed the vessel was not docked at Port Fourchon and potentially improved response times. Improved technology and EPIRB triage procedures would assist Command Centers with the response to multiple simultaneous distress alerts.

9.10.4. When the Coast Guard called Seacor regarding SEACOR POWER's EPIRB alert, the Dispatcher was not aware of vessel's operational status, and the Dispatcher failed to properly verify if the vessel was in distress. If the Dispatcher had not told the Coast Guard watchstander that the vessel was at the dock, the D8 command center would have initiated emergency response actions sooner.

9.10.5. The District Command Center addresses EPIRB alerts in the order they are received, regardless of vessel size or capacity, yet an alert from a properly registered EPIRB does contain information about the number of people carried on the vessel. There may be an opportunity to provide EPIRB triage procedures to assist Command Centers in recognizing and prioritizing distress alerts from high capacity vessels.

9.10.6. There are currently an extremely high number of EPIRB false alerts due to accidental activations and out-of-service beacons. These false alerts take time and focus away from true emergency alerts, and diminish the sense of urgency for each alert. The Coast Guard has statutory authority for prosecuting any person who "knowingly and willfully communicates a false distress message to the Coast Guard" (14 USC 521); this authority has not regularly been used to prosecute those who emit false alerts through their failure to properly secure or dispose of an EPIRB device. This authority may need to be utilized to help the efficiency of Coast Guard command centers. Additionally, the Coast Guard could initiate an education campaign to attempt to reduce false EPIRB alerts.

9.10.7. While it did not appear to be a factor in this case, vessels equipped with GMDSS have multiple methods of sending distress alerts, but different types of alerts are received by different Coast Guard units. As discussed above, District Command Centers receive EPIRB alerts. District Command Centers also receive INMARSAT alerts. Sector Command Centers can't receive EPIRB or INMARSAT alerts, but they can receive VHF DSC alerts. According to hearing testimony, neither Command Center has equipment to receive MF or HF DSC alerts. The Coast Guard should have the capability to receive all types of distress alerts. Additionally, while a de-centralized process can spread the workload of responding to distress alerts, there would be value in consolidating these capabilities to improve response actions when multiple alerts are received.

9.10.8. While the SAR Addendum recognizes that a person trapped in a capsized vessel is a potential SAR scenario, Coast Guard policy and procedures do not provide sufficient guidance and direction to assist watchstanders in quickly responding to this type of time sensitive incident.

9.11 Salvage

9.11.1. Diving services support, as defined in 33 CFR 155, Subpart I, does not explicitly address underwater search and rescue. After the SEACOR POWER incident, initial diving services were conducted according to agreement between Seacor and Donjon-SMIT, but these diving services were not related to the Coast Guard SMFF regulations.

9.11.2. Once active search and rescue activities were complete for SEACOR POWER, the Coast Guard transitioned its focus to pollution response and safe waterway navigation, in a manner consistent with the Coast Guard's statutory authority.

9.11.3. The Coast Guard does not have statutory or regulatory authority to direct recovery of remains from a vessel. The Coast Guard has limited authority to direct or require removal or salvage of a vessel in situations where the vessel poses a threat to the environment or a threat to safe waterway navigation.

10. Conclusions

10.1 Causal Factors That Contributed to the Capsizing (Event 1)

10.1.1. The biggest factor that contributed to the cause of SEACOR POWER's capsizing was the fact that the vessel was caught in unpredicted weather conditions that exceeded the vessel's operating limits. The winds that hit SEACOR POWER and the immediate surrounding areas that afternoon exceeded 80 knots and gusted up to 99 knots (measured at a 10 meter height).

10.1.2. The National Weather Service (NWS) cannot see what is happening close to the surface in Port Fourchon and coastal Louisiana.

10.1.3. The NWS does not receive any automated weather reports from the Port Fourchon area.

10.1.4. The New Orleans/Baton Rouge NWS office rarely receives ship observations.

10.1.5. The New Orleans/Baton Rouge NWS office is not receiving real time weather observations from Coast Guard Cutters and Stations.

10.1.6. The crew did not have procedures for unexpected weather conditions or for short duration weather events that exceeded their operating limits.

10.1.7. SEACOR POWER departed Port Fourchon with approximately 2.5 feet of aft trim, which was not in accordance with the trim limitation in the Marine Operations Manual (MOM). The crew stated that it was unrealistic to operate within the trim limit in the MOM.

10.1.8. The wind speeds contained in the regulatory criteria for liftboats do not represent realistic conditions, because the regulatory criteria calculates 60 and 70 knot winds in still-water, with no waves.

10.1.9. The shape coefficients for cylindrical liftboat legs that are contained in the regulations are too small.

10.1.10. It is not clear how to calculate the Code of Federal Regulations (CFR) range of stability criteria for liftboats.

10.1.11. The CFRs do not address the direction of the wind and inclination for liftboat stability calculations.

10.1.12. The safety factor built into the regulations for liftboats may not be a suitable design standard.

10.1.13. At a 5 degree list, part of SEACOR POWER's main deck would be submerged, and if the engine room doors, manholes, or vents on the lower side were open, this would have caused downflooding.

10.2 Causal Factors That Contributed to the Movement of Furniture and Equipment (Event 2)

10.2.1. Many items on SEACOR POWER were not properly secured.

10.3 Causal Factors That Contributed to the Flooding (Event 3)

10.3.1. The only required watertight doors on SEACOR POWER were the doors to the engine room. The superstructure was not watertight, and, as a result, it filled up with water very quickly after capsizing.

10.4 Causal Factors That Contributed to Individuals Entering the Water (Event 4)

10.4.1. As noted above, the only required watertight doors on SEACOR POWER were the doors to the engine room. This condition also contributed to individuals entering the water, because the superstructure filled up very quickly after capsizing.

10.4.2. The vessel capsized so quickly that there was virtually no time for any lifesaving actions.

10.5 Causal Factors That Contributed to Deaths and Presumed Deaths (Event 5)

10.5.1. The vessel capsized so quickly that there was no time for egress from the interior of the vessel prior to capsizing.

10.5.2. SEACOR POWER was not required to have, and did not have, a transitional source of electrical power.

10.5.3. SEACOR POWER did not release any distress calls prior to capsizing.

10.5.4. There are currently an extremely high number of EPIRB false alerts, which take time and focus away from true emergency alerts and diminish the sense of urgency for each alert.

10.5.5. The Seacor Dispatcher’s actions delayed the response to SEACOR POWER’s EPIRB alert.

10.5.6. Seacor’s Safety Management System did not include procedures for a Dispatcher to respond to an EPIRB alert.

10.5.7. The District Eight Command Center cannot view all of the critical information from SARSAT, SAROPS and CG One View on a common operating picture.

10.5.8. Each time District Eight Command Center watchstanders open a separate computer program, their computers slow down.

10.5.9. The District Eight Command Center addresses EPIRB alerts in the order they are received, regardless of vessel size or capacity.

10.5.10. The Sector Command Center does not receive EPIRB alerts directly.

10.5.11. The Sector Command Center phones were not working well on the day of the incident.

10.5.12. Vessels operating solely in the Gulf of Mexico are exempt from the regulatory requirement to carry immersion suits, even though the water temperatures can drop below 70 degrees in the winter and spring.

10.5.13. The crewmembers on Response Boat 45674 were not wearing heavy weather harnesses.

10.6 Causal Factors That Contributed to Vessel Sinking (Event 6)

10.6.1. Once the vessel capsized and flooded, there were no known defenses to preventing the vessel from sinking.

10.7 Unsafe Actions or Conditions that Were Not Causal Factors in this Casualty

10.7.1. SEACOR POWER's crew had access to Buoy Weather for checking forecasts, but the program was on the computer, which was not located on the bridge.

10.7.2. SEACOR POWER received a weather forecast on the morning of April 13th, but there was no evidence that anyone re-checked the weather forecast that day.

10.7.3. The Company Man had access to a separate weather forecast, but he did not re-check the forecast that day.

10.7.4. The Company provided a weather forecast to SEACOR POWER on the morning of April 13th, but they did not re-check the forecast that day.

10.7.5. Many of the methods for mariners to receive Special Marine Warnings are arranged so that a mariner has to look for the weather product, and the warnings do not automatically come to them.

10.7.6. There is no evidence that the Coast Guard broadcast any Special Marine Warnings over VHF radio on the day of the incident.

10.7.7. NAVTEX does not appear to be an efficient or effective system.

10.7.8. Due to an internet outage on April 13th, the Coast Guard did not send any NAVTEX broadcasts from the New Orleans site between 1000 and 1623.

10.7.9. There was no evidence that the Coast Guard reviewed or approved the current revision of SEACOR POWER's Marine Operations Manual.

10.7.10. The Cargo Securing and Marine Operations Manuals provided conflicting guidance regarding cargo securing.

10.7.11. The crew did not secure the cargo on the deck of SEACOR POWER on April 13th.

10.7.12. Liftboats load their cargo while the vessel is jacked up, which does not allow the crew to accurately assess the vessel's draft until loading is complete and the vessel is jacked down. This creates a disincentive to correct any stability problems.

10.7.13. Only seven of eight Offshore Workers followed Talos' check in procedures, which led to confusion about the number of individuals aboard SEACOR POWER.

10.7.14. The Master did not provide a full list with the name of each person that embarked the vessel that day, which also contributed to the confusion about the number of individuals aboard SEACOR POWER.

10.7.15. The Seacor Operations Manager did not have the underway experience to provide extensive support to the Master in the areas of navigation or onboard operations.

10.7.16. SEACOR POWER's lifesaving arrangements were not ideal for underway conditions.

10.7.17. SEACOR POWER's SART was not an effective piece of lifesaving equipment.

10.7.18. The Coast Guard does not receive all types of distress alerts in one consolidated location.

10.7.19. Coast Guard policy and procedures do not provide sufficient guidance and direction to assist watchstanders in quickly responding to a person trapped in a capsized vessel.

10.8 Actions and Conditions that Were Not Causal Factors in this Casualty

10.8.1. The Master would not have gotten underway on April 13th if he had any concerns about the weather. The Master did not receive pressure from Seacor (operator), Talos (charterer) or the Company Man (charterer's representative).

10.8.2. The Seacor Safety Management System (SMS) was working properly and was compliant with the ISM Code. SEACOR POWER was properly implementing the SMS.

10.8.3. The vessel was in good condition, was well maintained, and was in compliance with domestic and international requirements. The vessel was operating properly on the day of the incident and the departure condition met the applicable stability regulations. The vessel's procedure for loading cargo was effective.

10.8.4. SEACOR POWER's crew had the required credentials and training for their assigned positions. The Master and the First Mate had significant relevant experience.

10.8.5. There was no evidence that any individuals aboard SEACOR POWER were under the influence of alcohol or drugs.

10.8.6. Before SEACOR POWER capsized, the Master attempted to turn the vessel back to starboard, but this turn did not contribute to the capsizing.

10.8.7. Once the Coast Guard was alerted to SEACOR POWER's capsizing, they efficiently and effectively performed initial actions, planning, operations and conclusion of the Search and Rescue case, given the operational constraints of weather-limited response resources.

10.8.8. There was no evidence of acts of misconduct, incompetence, negligence, unskillfulness, or violations of law by a credentialed mariner that contributed to the cause of the casualty.

10.8.9. There was no evidence of acts of misconduct, incompetence, negligence, unskillfulness, or violations of law by Coast Guard employees, or any other person, that contributed to the cause of the casualty.

10.8.10. There was no evidence of acts that would warrant civil penalty.

10.8.11. There was no evidence of violations of criminal law.

10.8.12. There may be a need for new or amended U.S. law or regulation, and these issues are addressed in the recommendations section below.

11. Recommendations

11.1 Safety Recommendations:

11.1.1. *Safety Recommendation 1*: The Commandant should immediately revise Commandant Instruction 3140.2D and Commandant Instruction 3140.3D. The revisions should address the following issues:

- Which Coast Guard units are required to make severe weather radio broadcasts;
- What information is shared in a severe weather radio broadcast;
- When severe weather radio broadcasts are made;
- Which channel(s) are used for severe weather radio broadcasts, including, but not limited to distress channels or channels that are locally required in lieu of distress channels;
- Who is responsible for the decision to send severe weather radio broadcasts;
- How units are expected to balance search and rescue operations with severe weather radio broadcasts;
- How units will quickly receive severe weather radio broadcasts;
- Which Coast Guard units are required to send weather observations to the National Weather Service; and
- How Coast Guard units should send weather observations to the NWS.

11.1.2. *Safety Recommendation 2:* The Commandant should expedite their current study of liftboat stability, and then immediately use the results of that study to revise liftboat stability regulations. The Commandant should consider the following actions:

- Clearly define applicable stability requirements for liftboats inspected under 46 CFR Subchapter I and Subchapter L.
- Require liftboat stability calculations to evaluate realistic loading conditions and realistic trim conditions.
- Impose additional safety margins to mitigate the risks posed by environmental variability of wind and waves.
- Update the wind speed vs height profile used to calculate wind loads.
- Update wind calculation shape factors for cylindrical legs with racks.
- Provide clear procedures to establish operating restrictions without relying on oversimplified regulatory thresholds.

11.1.3. *Safety Recommendation 3:* The Commandant should immediately require all liftboat owners and operators to reduce the current operating limits for each vessel, in order to provide a temporary additional safety margin while the actions in the previous recommendation are completed.

11.1.4. *Safety Recommendation 4:* The Commandant should immediately establish a regulation or policy that prohibits offshore workers from riding aboard a liftboat while the vessel is underway, unless the vessel meets additional stability requirements to ensure a level of safety equivalent to a crewboat or offshore supply vessel.

11.1.5. *Safety Recommendation 5:* The Commandant should consider a new regulation or policy requiring liftboat owners and operators to create a quick reference guide for each vessel. The quick reference guide would establish clear and simple operating information, and could include topics such as wave limits, wind limits, draft restrictions, trim conditions, and emergency procedures for sudden changes in weather or weather that exceeds the vessel's operating limits.

11.1.6. *Safety Recommendation 6:* The Commandant should issue one or more findings of concern to the National Weather Service recommending the following items:

- Identify immediate options for increasing automated weather observation equipment in the highly trafficked areas of Port Fouchon and coastal Louisiana;
- Consider the use of the EAS to send special marine warnings to cell phones located in maritime areas;
- Establish industry working groups to collectively identify strategies and/or best practices to increase voluntary weather reporting in the Gulf of Mexico and to ensure this information is provided in a useful, efficient and accurate format;
- Creation of a joint Coast Guard-National Weather Service working group to explore whether there is value in creating a smart phone application that the public could use to provide voluntary weather observations;
- Consider issuing special marine warnings that contain a forecasted range of wind conditions, not just a forecast predicting winds over a certain speed; and

- Establish a working group to evaluate additional methods of describing special marine warning boundaries to the public and/or limiting special marine warning distribution to only the applicable areas.

11.1.7. *Safety Recommendation 7:* The Commandant should issue one or more findings of concern to all liftboat owners and operators stressing the importance of the following items:

- Lashing cargo, cranes, and deck equipment prior to getting underway;
- Taking immediate actions to properly secure all furniture, equipment, stores and other items that could shift in the event of heavy rolls or capsizing;
- Establishing procedures for frequent weather checks in order to monitor for unexpected weather changes while underway;
- Ensuring lifesaving equipment is reasonably spaced throughout the vessel; and
- Conducting liftboat audits while vessels are afloat and/or loading cargo in order to evaluate the crew's actions while preparing to get underway and validate the pre-departue condition is aligned with the operating manual and stability book.

11.1.8. *Safety Recommendation 8: The* Commandant should issue one or more findings of concern to all commercial vessel owners and operators stressing the importance of the following items:

- Training dispatchers and other individuals on call to know how to handle emergency situations (SMS procedures, quick response cards, or checklists could provide a useful tool for these individuals);
- Providing clear procedures to calculate draft readings, especially if a vessel is listing or if a vessel's draft marks are not aligned with the vessel's baseline; and
- Ensuring that each vessel is equipped with at least two independent methods of obtaining weather forecasts, and that those methods are readily available on the bridge or at the operating station.

11.1.9. *Safety Recommendation 9:* The Commandant should direct a concentrated inspection campaign designed to verify proper EPIRB registration on all types of vessels. The campaign could provide clear guidance and direction to marine inspectors (foreign and domestic), marine investigators, commercial fishing vessel examiners, cutter boarding teams, station boarding teams, Auxiliarists, and Public Affairs personnel in order to ensure all Coast Guard elements are participating in the campaign.

11.1.10. *Safety Recommendation 10:* The Commandant should consider whether there is an opportunity to establish a requirement for vessel owners or operators to provide proof of valid EPIRB registration prior to renewing or obtaining a Certificate of Documentation.

11.1.11. *Safety Recommendation 11:* The Commandant should consider whether there is an opportunity to update the SARSAT system so that when the Coast Guard receives notice of an EPIRB activation, the registered user also receives a notice.

11.1.12. *Safety Recommendation 12:* The Commandant should consider publishing additional information regarding false EPIRB alerts, including information about the huge costs associated with these false alerts.

11.1.13. *Safety Recommendation 13:* The Commandant should consider creating a Memorandum of Understanding or Memorandum of Agreement with the Federal Communications Commission (FCC) so that the Coast Guard can enforce the FCC's EPIRB registration requirements. Alternatively, the Commandant should issue clear guidance to all units explaining how to use the authority found in 14 USC 521 to enforce EPIRB registration.

11.1.14. *Safety Recommendation 14:* The Commandant should take immediate action to improve phone communications at all District and Sector Command Centers.

11.1.15. *Safety Recommendation 15:* The Commandant should consider whether there is an opportunity to establish equipment and processes to receive all types of distress alerts in one location, rather than different Coast Guard units.

11.1.16. *Safety Recommendation 16:* The Commandant should evaluate options that would allow District and Sector Command Centers to view EPIRB information, AIS information, and SAROPS information in one Common Operating Picture.

11.1.17. *Safety Recommendation 17:* The Commandant should consider whether there is a need to provide District and Sector Command Centers with additional means of tracking commercial vessel locations.

11.1.18. *Safety Recommendation 18:* The Commandant should conduct a study to evaluate whether it would be beneficial to create one distress button that links to a variety of different shipboard systems, including, but not limited to, VHF DSC, MF/HF DSC, INMARSAT, and the vessel's general alarm.

11.1.19. *Safety Recommendation 19:* The Commandant should create a campaign to educate vessel owners, operators and crew members on Digital Selective Calling (DSC) procedures and benefits.

11.1.20. *Safety Recommendation 20:* The Commandant should conduct a study to assess the usefulness of SARTs, and then use those study results to evaluate whether SARTs should be removed from the domestic and international regulatory requirements. This study could include an assessment of various SART brands, the equipment and equipment settings necessary to receive SART signals, success stories associated with SART use, and costs associated with SART purchase, maintenance and replacement.

11.1.21. *Safety Recommendation 21:* While awaiting the results of the SART study discussed in Recommendation 20 above, the Commandant should create an internal education campaign focused on training Coast Guard personnel to properly detect and identify SART signals.

11.1.22. *Safety Recommendation 22:* The Commandant should consider a working group, research study, or other method of assessing the effectiveness and usefulness of

NAVTEX, and then use those results to evaluate changes to the Coast Guard's NAVTEX equipment and processes.

11.1.23. *Safety Recommendation 23:* The Commandant should re-evaluate the regulatory requirement that exempts vessels operating between 32 degrees N and 32 degrees S latitude from carrying immersion suits. While water temperatures in some of these areas may remain warm all year round, water temperatures in some areas of this region can drop to levels that quickly cause hypothermia, especially during winter and spring.

11.1.24. *Safety Recommendation 24:* The Commandant should require all Coast Guard cutters and small boats to carry line throwing guns and train personnel in their use.

11.1.25. *Safety Recommendation 25:* The Commandant should consider a study to assess the usefulness of drones or remote operated life rings for delivering rescue equipment to individuals who are out of reach of a Coast Guard asset.

11.1.26. *Safety Recommendation 26:* The Commandant should consider establishing a policy that creates clear steps and procedures for a Coast Guard Marine Inspector to review and approve liftboat operations manuals, and then procedures for providing feedback to the vessel owner/operation and any other entity involved in writing or reviewing the manual.

11.1.27. *Safety Recommendations 27:* The Commandant should evaluate previous SAR cases to determine how many incidents involved underwater rescue, and use this information to evaluate whether there is a need for additional measures to prepare for underwater rescue situations.

11.2 Best Practices.

The following actions could be used as best practices, and they are listed here for members of the Coast Guard and the maritime industry to consider:

11.2.1. *Best Practice 1:* All companies should establish a process to ensure that their employees update their next of kin information at least once a year.

11.2.2. *Best Practice 2:* It can sometimes be difficult to reach a mariner's next of kin, so all companies should consider asking their employees to provide multiple contact numbers for that person(s).

11.2.3. *Best Practice 3:* The registration form for an Emergency Position Indicating Radio Beacon (EPIRB) includes multiple lines for phone numbers. An individual registering an EPIRB should consider adding several different phone numbers that could be used in the event their EPIRB is activated.

11.2.4. *Best Practice 4:* Personal, and non-required, use of PLBs should only be used by a mariner if they are willing to properly register and regularly update their device registration.

11.2.5. *Best Practice 5:* Vessel owners and operators should ensure that any required SART poles are always connected to, or stored in close proximity to, the SART.

11.2.6. *Best Practice 6*: Vessel owners and operators, classification societies, auditors, and Coast Guard Marine Inspectors should ensure that computer programs used to aid in stability calculations are validated on a regular basis, but no less than annually.

11.2.7. *Best Practice 7:* Vessel owners and operators should provide additional weather training to their Masters and licensed crew members. Training could include items such as options for checking weather underway, minimum intervals to check weather while underway, emergency procedures for unexpected weather changes, and providing voluntary weather reports to the National Weather Service.

11.2.8. *Best Practice 8:* Vessel owners and operators should review each vessel's operations manual to ensure that the conditions described in the manual represent realistic operating conditions.

11.2.9. *Best Practice 9:* Companies that own or operate liftboats should review each vessel's operating guidance and establish clear and simple directions for the Master and crew. The review should include, but not be limited to, stability calculation procedures, reading draft marks, operating restrictions, cargo securing processes, and emergency steps for unexpected weather.

11.2.10. *Best Practice 10:* Companies that employ individuals who serve as offshore workers should consider a requirement to have each individual pass basic swim training.

11.2.11. *Best Practice 11:* Vessel owners and operators should consider a requirement to have their crewmembers wear reflective coveralls (or other reflective clothing), and carry flashlights and knives (or another type of cutting device) while underway.

11.2.12. *Best Practice 12:* Coast Guard District and Sector Command Centers should ensure that all of their watchstanders are familiar with the list of outside companies that are available to assist with Search and Rescue activities, which is required by Section 1.5 of the SAR Addendum. They should also review their Quick Response Checklists to ensure they include appropriate steps to check with these outside companies.

11.2.13. *Best Practice 13:* Coast Guard District and Sector Command Centers should ensure that all of their watchstanders are familiar with types of vessels and common geographical references for their area of responsibility, including offshore block names and numbers assigned by the Bureau of Ocean Energy Management.

11.2.14. *Best Practice 14:* During the response to this incident, the Coast Guard Sector Commander provided his direct phone line to the representative for SEACOR POWER's operator.

11.2.15. *Best Practice 15:* Coast Guard Areas, Districts and/or Sectors should identify a list of experienced individuals who can serve as a Subject Matter Expert and/or the Coast Guard's single point of contact for Next of Kin notifications in a Mass Rescue Operation.

11.2.16. *Best Practice 16:* Coast Guard Areas, Districts and/or Sectors should consider establishing processes or procedures to create a continuous channel of communications (via Teams or another application) for Mass Rescue Operations or other cases involving response by numerous different Coast Guard units.

11.3 Administrative Recommendations:

11.3.1. *Administrative Recommendation 1:* The Commandant should release this Report of Investigation to the public immediately, and then generate the Coast Guard's Final Action Memorandum afterwards.

11.3.2. *Administrative Recommendation 2:* The Commandant should request additional permanent Coast Guard billets to perform the work associated with a Marine Board of Investigation. Alternatively, the Commandant should identify funding and establish a clear process to provide backfills for some or all of the MBI members for at least one year following the convening order. The current practice of assigning members to serve on a MBI as a collateral duty, while they are still required to perform their regularly assigned job, causes extensive delays to all aspects of the investigation process.

11.3.3. *Administrative Recommendation 3:* The Commandant should create a working group with NTSB representatives to see if there are any best practices or other options to minimize the duplication of government efforts while still allowing both agencies to conduct separate investigations.

11.3.4. *Administrative Recommendation 4:* The Commandant should close this investigation.

[redacted]
T.O. Phillips
Captain, U.S. Coast Guard
Chair, Marine Board of Investigation

Enclosure: Marine Board of Investigation Convening Order