

UNITED STATES COAST GUARD

ADDRESS REPLY TO
COMMANDANT
U. S. COAST GUARD
HEADQUARTERS
WASHINGTON 25, D. C.



MVI
• (DRILLING BARGE
MR. K - a-8 Bd)
22 MAY 1958

Commandant's Action on the report of

Marine Board of Investigation; DRILLING BARGE MR. K,
capsizing of, 17 April 1957, in the Gulf of Mexico,
with loss of life

1. Pursuant to the provisions of Title 46 CFR, Part 136, the record of the Marine Board of Investigation convened to investigate subject casualty has been reviewed.
2. Nine lives were lost, three persons injured and substantial property damage occurred when, on the morning of 17 April 1957, while being towed, the DRILLING BARGE MR. K suddenly capsized in the Gulf of Mexico about $1\frac{1}{2}$ mile E_{1/2}N from the entrance to South Pass at the mouth of the Mississippi River.
3. The DRILLING BARGE MR. K, Official Number 272256, owned and operated by the Golden Meadow Well Service Company, New Orleans, La., was a manned, uninspected, steel, slotted type mobile platform, the hull 1026 g.t., length 164', breadth 54', depth 11'10". The elevated super-structure included living quarters, machinery spaces, and a helicopter deck and was fitted with a drilling derrick having a height, when raised, of 183'10" above the keel. The structure had been designed and built in 1956 by the Bethlehem Steel Company, Beaumont, Texas, for oil drilling offshore in depths not exceeding 14 feet. Ballast tanks within the hull of the barge enabled it to be sunk to the bottom within the 14' range and subsequently refloated for shifting to other locations.
4. On 15 April this barge had been positioned near the entrance to South Pass in the Gulf of Mexico, resting upon a prepared foundation of shells. On 16 April adverse weather caused damage to the shell bed, necessitating the removal of the barge so that this foundation might be repaired. At 0700 on 17 April refloating was commenced; the ballast tanks were pumped, the spuds holding the barge in position were raised and shortly before 0900, on an even keel with drafts of 8 feet, towing began with the derrick in the raised position. Because drilling had been prematurely discontinued there was on board a large quantity of heavy steel pipe and other supplies considerably in excess of that normally carried when under tow. An undetermined amount of water remained in the ballast tanks. The fresh water tanks were cross connected with sluicing valves open. At 0938, while proceeding at about 3 knots on a SSW course, wind SE to SSE 10 to 15 mph, with SE ground swells estimated at 3 feet, the barge suddenly began listing to port, and within 2 minutes capsized and floated bottom up. Of the

15 men aboard, 5 were reportedly asleep in their quarters when the accident occurred.

5. Although the derrick had been designed for lowering to a horizontal position, it had never been lowered while under tow, on at least four prior shiftings. Operating personnel apparently were unaware of the hazards involved in the ballasting, deballasting and movement of this vessel, particularly with regard to stability. The Board concluded that the instability resulted from the combined effect of the unusual topside weight of pipe and supplies, the raised position of the derrick, and the water in the ballast and fresh water tanks. The Board further concluded that the upsetting force was derived from the effect of the SE ground swells on the beam of the hull and the probable effect of the wind upon the upper portions of the derrick.

6. The Board recommended (a) that all mobile platforms located beyond the headlands but less than three miles offshore be made subject to the regulations promulgated for mobile platforms on the Outer Continental Shelf; (b) that these Regulations be amended to require the approval of plans, stability tests, and inspection during construction; (c) that these platforms while under tow shall have the least possible number of persons aboard, not to exceed two; (d) that the lowering of such derricks be mandatory, and (e) that the submerging, refloating and movement of these platforms, including preparation therefor, be only under the direct supervision of competent personnel having marine engineering experience and a practical knowledge of stability.

REMARKS


7. Although there appears to have been a possibility that certain design features of this equipment may have created conditions contributory to the casualty, the fact that this rig had been moved on at least four previous occasions without accident strongly suggests the probability that the causative error was operational. Plan approval and inspection during construction will not eliminate operational errors stemming from inadequate knowledge of stability. It is recognized that these mobile platforms are unique in many respects; they are not vessels in the usual sense but the forces and moments affecting equilibrium are constantly present. Stability in this particular type of structure becomes critical when buoyancy is dissipated during the submerging operation and, similarly, foundational stability is lost as flotation is resumed.

8. The problems of safety associated with the operation of these off-shore drilling rigs have been under study by the industry, by various governmental agencies and by others. The equipment, of various types and with many different operating systems, must continue to be regarded as experimental to a great extent. The optimum of safety is often thwarted by conditions necessarily present during any experimental stage. It follows logically that any regulations, safety codes or operational guidelines, to be effective, must be based upon

a recognition of all the practical factors involved and the peculiarities of each individual rig.

9. With this in mind, and in view of our favorable experience with the encouragement of industry self-regulation whenever it is consistent with the safety objectives being sought, the Panel of Advisors on Offshore Operations to the Commander 8th Coast Guard District was invited to consider and submit recommendations for a comprehensive code of safe operating practices or other effective means which would reduce the probability of similar accidents in the future. In response thereto a special committee representing the industry made a study of the problem and drafted a "Manual of Safe Operating Practices for Offshore Mobile Drilling Platforms" which was distributed in the industry for additional study and comment. This proposes certain rules, minimum standards and recommended procedures applicable in general to all such platforms but taking into account the special features and characteristics of the individual rigs. It encompasses the determination of stability; the moving, raising, refloating and submerging of the rig; special hurricane procedure, etc., and includes the correlated subjects of manning, personnel qualification, supervision and responsibilities, use of safety equipment, etc.

10. In view of the progress being made toward the development and industry wide acceptance of a program which will satisfy the requirement for safe control over the movement and operation of these rigs, I find no need, at this time, for further action on the recommendations of the Board. Accordingly, subject to the foregoing remarks, the Findings of Fact, the Conclusions, and the Recommendations of this Marine Board of Investigation are APPROVED.


A. C. RICHMOND
Vice Admiral, U. S. Coast Guard
Commandant

REPORT OF
MARINE BOARD OF INVESTIGATION

Convened 22 April 1957, at New Orleans, La.

To inquire into the circumstances surrounding the capsizing of mobile drilling rig, DRILLING BARGE MR. K, in the Gulf of Mexico, near South Pass entrance, on 17 April 1957, with loss of life.

2 October 1957

Subj: Marine Board of investigation; capsizing of mobile drilling rig, DRILLING BARGE MR. K, Gulf of Mexico, 17 April 1957, with loss of life

FINDINGS OF FACT

1. On or about 0938, 17 April 1957, the mobile platform DRILLING BARGE MR. K capsized in the Gulf of Mexico in approximate position $28^{\circ} 59.6' N$, $89^{\circ} 07.3' W$, while underway in tow of tugs MADELINE and ITCO II, with loss of nine (9) lives and injury to three (3) persons. This position is approximately 1.5 miles distant and 075° true bearing from East Jetty Light, South Pass.

2. Vessels involved:

a. DRILLING BARGE MR. K, O. N. 272256, an uninspected steel hull mobile platform of 1026 gross tons, 1026 net tons, dimensions 164' x 54' x 11'10", home port New Orleans, La., built at Beaumont, Texas, in 1956, owned and operated by Golden Meadow Well Service Company, Carondelet Building, New Orleans, La. The DRILLING BARGE MR. K is a slotted type drill barge with elevated superstructure. This barge was designed and built by Bethlehem Steel Company, Shipbuilding Division, Beaumont Yard, Beaumont, Texas, for use in water not exceeding 14' depth. The barge hull was subdivided into four ballast tanks, two fresh water tanks, one fuel tank, on centerline forward of slot, three fresh water tanks in rakes, one fresh water well on centerline just aft of fuel tank, and one drain well, as shown on general arrangement plan, Exhibit 1. There was a pump deck extending full width and length of barge located 8' above the barge deck. The quarters and engine house were located on next deck up, which was 32'2" above keel, and on top of the quarters was a heliport at 46'8" above keel. This barge was fitted with a derrick for drilling, the drilling floor being aft of quarters and engine house and 40'10" above the keel. The derrick when in the raised position extended 143' above the drilling floor or 183'10" above the keel. The slotted end of hull is considered to be the stern.

b. ITCO II, O. N. 271737, uninspected steel hull twin screw 600 HP Diesel tug, 63' in length, 72 gross tons, 49 net tons, built at Lockport, Louisiana in 1956, home port New Orleans, La., owned by Independent Towing Co., Inc., Harvey, La., and chartered by Otto Candies, Inc., Des Allemands, La.

c. MADELINE, O. N. 271021, uninspected steel hull twin screw 600 HP Diesel tug, 63' in length, 53 gross tons, 36 net tons, built at Houma, La. in 1956, home port New Orleans, La., owned by Franklin Towing Co., Inc., Des Allemands, La., and chartered by Otto Candies, Inc., Des Allemands, La.

3. Weather conditions - wind SE to SSE, 10-15 mph, visibility good, 3' ground swells. Small craft warnings hoisted 8:00 AM (CST) 16 April 1957 from Galveston, Texas to Pensacola, Florida for Southeasterly winds about 25 mph, except occasionally around 35 mph in thundershowers throughout the night. Small craft warnings were lowered at 8:00 AM (CST) on 17 April 1957.

4. On Monday, 15 April 1957, the DRILLING BARGE MR. K was moored on location in Gulf of Mexico, near entrance to South Pass, Mississippi River, at lat. 29-00-20.0 N, long. 89-07-42.9 W, by lowering barge so that it sat on a shell bed that had been built up at this location. The barge was made fast with its spuds in approximately twelve feet of water. Preparations were begun to drill a well at this site for Humble Oil and Refining Company. On the morning of 16 April 1957 preparations for drilling were completed but the weather began making up (note - small craft storm warnings hoisted at 0800 16 April 1957, (Exhibit 32) and operations were stopped. The seas from the Southeast began washing away the shell bed foundation and Humble Oil and Refining Company ordered barge moved in order to rebuild the foundation. At Humble's orders the tugs MADELINE and ITCO II were to tow barge to Joseph's Bayou. About 0700 Wednesday 17 April 1957 preparations were begun to float barge by pumping or "jetting out" the four ballast tanks in the hull of the barge. At some time prior to 0900 the barge was afloat and spuds pulled up into hull. About 0900 the tugs ITCO II and MADELINE, made up in tandem ahead of barge, began towing. The tow followed a circular course beginning first to the North and swinging wide around to the East and steadied on a course about SSW. After having been steady on this course an estimated fifteen minutes and at a speed of 3 knots, about 0938 the drilling barge began listing to port and continued on over until it was in a capsized position with the bottom of the hull out of the water. The barge capsized without warning in less than two minutes, resulting in loss of nine lives and injury to three persons.

5. DRILLING BARGE MR. K was an artificial island which included as integral part of itself features which permit it to be moved as an entity from position to position and to be fixed to or submerged onto the seabed.

6. At the time barge got underway, on or about 17 April 1957 at 0900, draft was reported to be 8' and on an even keel.
7. The derrick was in the raised position at the time of capsizing with traveling block on the deck at the foot of the derrick and no pipe hanging in the derrick.
8. Tanks in barge were fitted with sounding pipes which extended to the pump deck. These sounding pipes were not utilized to determine the condition of the tanks on the morning of the casualty, nor had they ever been used.
9. [REDACTED] Assistant Drilling Superintendent for Golden Meadow Well Service, was in charge of the drilling barge at the time of capsizing. Mr. [REDACTED] had gone on board the morning of 15 April 1957 and remained on board until casualty occurred. Mr. [REDACTED] had been on this barge on several previous occasions, including times when it had been pumped out and moved to a new location.
10. [REDACTED] Tool Pusher, was assistant to [REDACTED] at time of casualty and the person normally in charge of all operations on DRILLING BARGE MR. K. Mr. [REDACTED] had been working on this barge since August 1956 when it was on first location.
11. According to [REDACTED] the condition of the tanks in the barge itself were as follows:

bow rake tank - dry
ballast tank, starboard forward - about 1' water
fresh water tank, starboard amidships - about 3' water
fresh water tank, port amidships - about 3' water
ballast tank, starboard aft - about 1' water
ballast tank, port forward - about 1' water
ballast tank, port aft - about 1' water
stern rake tank, starboard - dry
stern rake tank, port - dry
fuel tank, on centerline - 2/3 full

12. According to [REDACTED] the condition of the tanks in the barge itself were as follows:

bow rake tank - dry
ballast tank, starboard forward - 4" water
fresh water tank, starboard amidships - about 3½' water
fresh water tank, port amidships - about 3½' water
ballast tank, starboard aft - 4" water
ballast tank, port forward - 4" water
ballast tank, port aft - 4" water
stern rake tank, starboard - didn't know
stern rake tank, port - didn't know
fuel tank, on centerline - about 2/3 full

13. The sluicing valve between port fresh water tank amidships and center-line drain well was open. The sluicing valve between the starboard fresh water tank amidships and same drain well was open.

14. The condition of the ballast and water tanks as reported by Flowers and Ballard was based only on their knowledge that the pumps lost their prime and pumped no more water. Soundings were not taken although the tanks were fitted with sounding pipes that extended to the pump deck.

15. The DRILLING BARGE NO. K was actually and continuously occupied by persons living and accommodated thereon. At time of this casualty there were fifteen persons on board, five of whom were reported to be asleep in sleeping quarters provided.

16. According to testimony of [REDACTED], the following stores and supplies were known to be on board at time of casualty:

Reserve mud pit, starboard - 5' salt water
reserve mud pit, port - $4\frac{1}{2}$ ' of 11.5 drilling mud (11.5 lb/gal)
transverse active mud pit - 1' water
longitudinal active mud pit - empty
fuel oil dry tank - full
2251 sacks weighing mud @ 100 lb/sack - dry mud store room
400 sacks jell mud @ 100 lb/sack - dry mud store room
160 sacks clay mud @ 100 lb/sack - dry mud store room
10,700 lbs. caustic soda - dry mud store room
14,900 lbs. kabroko (phonetic) - dry mud store room
4,500 lbs. CMCA starch mud - dry mud store room
1,450 lbs. lost circulation material - dry mud store room
5,500 lbs. fiber seal - dry mud store room
250 lbs. fiber tex - dry mud store room
1,800 lbs. graphite
6,500 ft. $4\frac{1}{2}$ " drill pipe, pipe rack, port ($4\frac{1}{2}$ " pipe @ 16.60 lbs/ft)
8,000 ft. 4" drill pipe, pipe rack, starboard
1,000 ft. 20" casing pipe, pipe rack, port (20" pipe @ 94 lbs/ft)
NOTE: Pipe racks are fitted each side of slotted section 10'
above the pump deck.

17. According to testimony of [REDACTED] the starboard reserve mud tank contained $3\frac{1}{2}$ ' of 11.5 pound per gallon mud and the port reserve mud tank was filled to within 8" to 10" of the top with sea water.

18. According to testimony of [REDACTED], there was no lifesaving equipment on board.

19. According to testimony of the other survivors there was general agreement that the following equipment was on board:

- 24 - adult life preservers
- 2 - 15 person balsa life floats
- 4 - ring buoys

20. The 20" pipe casing and the mud, caustic soda and other material in the dry mud store room were placed on board after the barge was on location in the Gulf of Mexico.

21. At the time of this casualty this was the heaviest load of material and supplies that the barge had had on board when being moved (p. 105, q. 7).

22. This rig was not equipped with a general alarm system.

23. This rig was not provided with a station bill.

24. There is no record of any Coast Guard inspection for compliance with regulations for artificial islands and fixed structures.

25. There is no record or knowledge of any emergency drills being held by personnel on board.

26. Mr. [REDACTED] Naval Architect, and person responsible for design of the DRILLING BARGE MR. K, testified that this equipment was designed for marginal offshore waters.

27. Mr. [REDACTED] testified as to stability characteristics of this barge and according to his calculations even at an eight-foot draft the range of stability was 23°.

28. An inclining experiment was not performed, and the center of gravity was determined by calculation.

29. Mr. [REDACTED] testified the scantlings of the hull were in accordance with American Bureau of Shipping Rules for inland waters. However, the barge was not built to or inspected for ABS classification.

30. The 4½" and 20" pipe in the pipe racks moved slightly after the barge started to capsize to port.

31. An inspection of the bottom of the hull by the Board of Investigation while vessel was still capsized found the bottom plating to be intact and undamaged.

32. The tow was made up with the tugs in tandem, the tug MADELINE in lead, and tug ITCO II astern of MADELINE. The ITCO II was made fast to the DRILLING BARGE MR. K with a 45' bridle and hawser of about 300' long.

33. The person in charge of the tug MADELINE at time of casualty, [REDACTED], testified he had six to seven months experience in charge of tugs but this was the first time he had towed a mobile platform in the open waters of the Gulf of Mexico. It was also the first time he had been in the Gulf of Mexico at South Pass where this casualty occurred. He did not hold any license issued by the Coast Guard.

34. The person in charge of the tug ITCO II, [REDACTED] testified he had six years experience on tugs and had handled equipment similar to this drilling barge on inland waters and the DRILLING BARGE MR. K one time in open waters. He did not hold any license issued by the Coast Guard.

35. A thunderstorm occurred at time of or immediately after the casualty as evidenced by testimony of [REDACTED] (p. 81).

36. Coast Guard aircraft encountered disturbances upon approaching scene of casualty shortly after it occurred.

37. The following Coast Guard aircraft and surface craft rendered assistance by searching area for survivors:

- a. Airplane from CG Air Detachment, Biloxi
Airplane No. UF-1G-1271
- b. Helicopters from CG Air Detachment, New Orleans
Helicopter No. HO 3 S 232
Helicopter No. HO 3 S 235
- c. Patrol boats from CG Moorings, Pilottown, La.
Boat No. 40418
Boat No. 40445

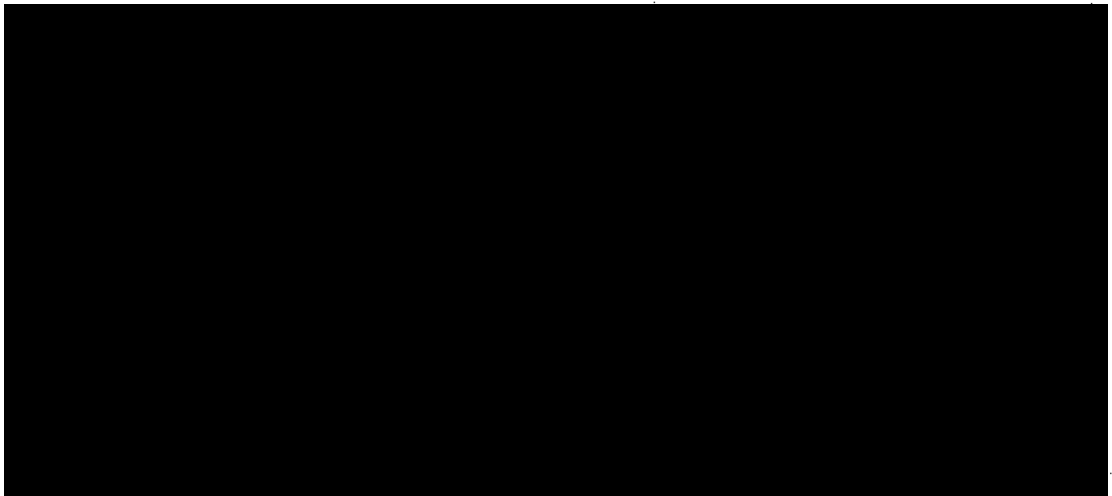
38. The derrick on the rig was designed to be lowered into a horizontal position as shown in EXHIBIT NO. 2. The barge had been moved on at least four previous occasions and each time the derrick was in the raised position. Testimony further brought out that derrick had not been lowered since being raised on first location.

39. The DRILLING BARGE MR. K has not yet been successfully salvaged. Golden Meadow Well Service Co. advised by letter of July 22, 1957 that the barge had been sold to A. Marx & Sons, New Orleans, La. on July 18, 1957

On September 1, 1957 the hull, with an undetermined part of the superstructure attached, was towed from location to Crescent Towing & Salvage Co. dock, New Orleans, with the barge still in the capsized position. The Recorder was advised verbally by A. Marx & Sons that the helicopter deck, quarters and derrick were not attached to the portion of the rig towed up river.

40. Local Notice to Mariners No. 44, dated April 19, 1957, issued by Commander, Eighth Coast Guard District, gave notice that the DRILLING BARGE MR. K was a menace to navigation and this notice is still in effect.

41. The following persons were on board the DRILLING BARGE MR. K at time of casualty:



42. The following persons on board at time of capsizing were lost by drowning:

Fred Elmer Stanford

Next of kin, wife, [REDACTED]

Roche Fauchoux

Next of kin, wife

Mrs. [REDACTED]

Louis Hightower

Next of kin, wife, [REDACTED]

Jasmer Harvey, Jr.

Next of kin, wife

Mrs. [REDACTED]

Henry John Gueret

Next of kin, wife

Mrs. [REDACTED]

43. The following persons on board at the time of the casualty are still missing and presumed drowned:

[REDACTED]

Next of kin, son

[REDACTED]

[REDACTED]

Next of kin, wife

[REDACTED]

Next of kin, father

[REDACTED]

Next of kin, wife, [REDACTED]

[REDACTED]

44. The following persons on board at time of casualty were injured:

[REDACTED]

Shock, nervous disorder of stomach, vomiting blood

Shock, water in lungs

Shock, leg bruises

45. Witnesses interviewed:

[REDACTED]

[REDACTED]

[REDACTED]

CONCLUSIONS

46. That the DRILLING BARGE MR. K capsized because of poor stability conditions including no range of stability that can be attributed to a combination of part of or all of the following factors:

- a. Derrick in raised position
- b. An undetermined amount of water in tanks of barge
- c. Cross connecting of the fresh water tanks in barge
- d. Addition of 1000' of 20" casing pipe and over 300,000 lbs. of materials in the mud storage room after arriving on location
- e. Lack of knowledge of stability by any person on board

47. That the upsetting force or moment is not known. However, it is felt that the ground swells from SE striking the barge on its beam could well have been the upsetting force. Another possibility is that there were strong upper air winds that struck the derrick and this could be an upsetting force.

48. That the calculations by Mr. Steele as shown in Exhibit No. 8 did not take into account the cross connecting of the fresh water tanks in the hull. When this is taken into account the value of KG becomes 35.67 and GM is only 5.50 in lieu of figures shown on Sheet No. 6 for calculations at draft of 7.6' F. W.

49. That the DRILLING BARGE MR. K was designed for inland waters and not for the unprotected waters of the Gulf of Mexico.

50. That the DRILLING BARGE MR. K is a mobile platform as defined in 33 CFR 140.10-30.

51. That the DRILLING BARGE MR. K is a manned platform as defined in 33 CFR 140.10-25.

52. That the DRILLING BARGE MR. K was not subject to the regulations applicable to manned mobile platforms as set forth in 33 CFR subchapter N, since it was less than 3 miles offshore and therefore not on the Outer Continental Shelf.

53. That the persons in charge of the tugs MADELINE and ITCO II were not experienced in handling tows such as the DRILLING BARGE MR. K in the Gulf of Mexico. In addition, both displayed a general lack of

knowledge of piloting and the use of a nautical chart when testifying during this investigation. However, there is no wilful violation on the part of either person, and there is no action indicated under authority of R. S. 4450, as amended, since neither person was serving under the authority of any license or certificate issued by the Coast Guard.

54. That the Coast Guard assistance, which consisted of conducting air and surface search for survivors, was timely and satisfactory.

55. That there was sufficient lifesaving equipment on board but that none was actually used in this case. The testimony of Plez Ballard on this subject must be disregarded in view of the testimony of the other survivors and witnesses.

56. That the key personnel on board the DRILLING BARGE MR. K were primarily men well experienced in the oil drilling industry. However, it becomes evident from testimony received that none of the personnel were aware of any hazards or dangers connected with ballasting, deballasting, and operating a vessel such as this drilling barge, particularly in the open waters of the Gulf of Mexico.

RECOMMENDATIONS

57. That the regulations promulgated pursuant to Section 4(c)(1) of the Outer Continental Shelf Lands Act be amended to require plan approval, stability test and inspection during construction of all mobile platforms, as defined in 33 CFR 140.10-30.

58. That mobile platforms in waters beyond the headlands but less than 3 miles offshore be made subject to any regulations promulgated for mobile platforms on the Outer Continental Shelf.

59. That until such time that above recommendations are carried out, immediate steps be taken to require mobile platforms be unmanned when being towed in waters beyond the headlands in order to prevent further loss of life. If this is not practical, it is further recommended that no more than two persons be permitted to remain on board in this situation.

60. That until such time as recommendations 57 and 58 above are carried out immediate steps be taken to require mobile platforms to lower their derricks when being towed in waters beyond the headlands in order to increase the stability of the vessel.

61. That a person with marine engineering experience and a practical knowledge of stability be required to be in charge of mobile platforms when preparing for and moving from one location to another.

(Signed) James B. Rucker
JAMES B. RUCKER, CAPTAIN, USCG
Chairman

(Signed) Edward J. Worrel, Jr., Commander, USCG
EDWARD J. WORREL, JR.
Member

(Signed) William F. Rea III, Commander, USCG
WILLIAM F. REA III
Member and Recorder