

UNITED STATES COAST GUARD



MVI  
13 July 1956  
(WASHINGTON MAIL -  
C-13 Bd)

Commandant's Action

on

Marine Board of Investigation; SS WASHINGTON MAIL, structural failure and foundering, Gulf of Alaska, 3 March 1956

1. Pursuant to the provisions of Title 46 C.F.R. Part 136, the record of the Marine Board of Investigation convened to investigate subject casualty, together with its Findings of Fact, Opinions, and Recommendations, has been reviewed.

2. The WASHINGTON MAIL, a C3-S-A2 cargo vessel of 7943 g.t., was built in 1945 by the Ingalls Shipbuilding Company, Pascagoula, Mississippi, and after two years' Government operation, was acquired in 1947 by the American Mail Line, who continuously operated her thereafter. During 1947, welded doublers were installed on the sheer strakes in order to permit an increase in draft. She sustained two casualties, one in 1949 when she grounded while fully loaded, and the other in 1954 when she suffered dock damage during a typhoon, which damages were satisfactorily repaired. In 1954 a small fracture developed at a corner of the midship deckhouse and again in April 1955 a small fracture developed at another corner of the same house, which fractures were satisfactorily re-welded.

3. On 29 February 1956 with nine passengers and fifty-one crew members on board, and fully loaded including a deck cargo of lumber, the WASHINGTON MAIL departed from Seattle for Yokohama. The weather encountered was as follows:

<u>Date</u>	<u>Wind</u>	<u>Force</u>	<u>Air Temp.</u>	<u>Sea Temp.</u>	<u>Sea</u>
29 February	SW	4	42° - 43°	44°	Long, low swell
1 March	SW - W	4-5	45° - 39°	44° - 42°	Moderately heavy swell
2 March	SW - NW	5-7	41° - 28°	42° - 38°	Long, low swell
3 March	NW	4-7	29° - 27°	38° - 39°	Moderately heavy swell

The vessel was not forced nor did she labor in any of the above weather.

4. At 1315 3 March 1956, sensations of hogging and sagging were felt and internal loud, deep rumbling sounds were heard which continued for less than five seconds, culminating in the vessel separating into two complete sections at a point in the vicinity of the after end of No. 3 hatch coaming. At 1515

the forward section, with no persons on board, capsized and sank. The after section, following the rescue of all persons on board by the USNS GENERAL FREEMAN, sank at 2118 in position 53° 54' North Latitude, 146° 27' West Longitude. The value of the vessel was estimated at \$2,000,000 and the value of the cargo is also estimated at the same amount. No lives were lost nor were any serious injuries sustained as the result of this casualty.

REMARKS

5. The Board's Opinion, subparagraph 20 j, and Recommendation, subparagraph 22 a, state as follows:

"20 j. The facts adduced in this case lead the Board to feel that it is a matter of utmost urgency that immediate steps be taken to rectify the situation which is believed to exist in the structure of C-3 type cargo vessels. It seems apparent that the steel of which these vessels were built, at least through 1945, is notch sensitive and must have a relatively high transition temperature. In this connection the Board feels that previous standards which were widely accepted throughout the marine industry as to the meaning of the term 'seaworthiness', as applied to vessels of this class, must be modified unless immediate steps are taken to strengthen the structure of these vessels."

"22 a. The Board therefore recommends that the Commandant consider requiring the immediate strengthening of all vessels of this class by the fitting of the same with appropriate slotted and riveted crack arrestors and such other reinforcement of the hull girder as is deemed necessary in order to prevent similar casualties in the future."

6. The above Opinion and Recommendation indicate that it is of the utmost urgency that immediate remedial action be taken with respect to the structural sufficiency of C-3 type vessels. Where there is any question of the seaworthiness of vessels subject to inspection, it must be constantly kept in mind that marine inspectors are required to assure themselves by internal and external examination of the vessel at annual inspections and reinspections and such other tests, including putting the vessel in motion, as may be necessary, that the vessel is in good condition and is of a safe and suitable

structure for the service in which it is employed and that it is in a condition to warrant the belief that it may be used in navigation with safety to life. C3-S-A2 type cargo vessels have been in operation since early in World War II, or approximately 13 years. The WASHINGTON MAIL was the first vessel of this type to suffer any structural failure which resulted in a serious marine casualty. Nothing in the record in any way indicates that the inspections of the WASHINGTON MAIL were not carried out in accord with applicable statutory requirements and accepted inspectional standards.

7. The matter of structural failures has been the subject of intensive study since the susceptibility of welded ships to extensive fractures became known early in World War II. As the knowledge of the problem increased, corrective means have been applied to the construction of new ships and steps have been taken on existing ships to improve their resistance to this type of casualty. The steps taken on existing ships have included the alteration of certain details of the structure, such as hatch corners, bilge keels, and the fitting of riveted crack arrestors, etc., designed to limit the spread of a fracture after its inception. Action has already been instituted for the application of additional requirements to C-3 type vessels.

8. A great deal has been learned since 1943 when the SCHENECTADY broke in two. The knowledge gained by experience, testing, and technical study is being applied to the design and construction of new ships, and the record of ships built since 1945 has been excellent. With respect to the ships now existing which were built during the war, the record is not as good, since some of the improvements developed, as for example, improved steel specifications, cannot be applied to an existing ship. For these ships the Coast Guard proposes to continue its program of careful analysis of any defects which develop, coupled with prompt action when the need for it is apparent.

9. Existing Federal Communications Commission Rules now cover the Recommendation contained in subparagraph 22 c of the Board's report and further action with respect thereto is unnecessary.

10. The Recommendations that lifeboats on cargo vessels be fitted with motor propulsion, that all lifeboats be equipped with spray shields to reduce the effect of wind and spray at low temperatures, that engine rooms of C-3 type vessels be equipped with permanent cross connection arrangements such that all pumps can readily and easily be used to discharge water from the engine room, and that more questions concerning damage control of both deck and engineer officers be included in the examinations of such officers will be referred to the Merchant Marine Council for appropriate study and recommended action.

MVI

(WASHINGTON MAIL - C-13 Bd)

11. Subject to the foregoing Remarks, the Findings of Fact, Opinions, and Recommendations of the Marine Board of Investigation convened to investigate subject casualty are approved.

(signed) A. C. Richmond

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

REPORT

of a

MARINE BOARD OF INVESTIGATION

convened in Room 117

Federal Office Building

Seattle, Washington

on 7 March 1956

by order of

Commandant, U. S. Coast Guard

To investigate structural failure and foundering of the SS WASHINGTON MAIL in  
Gulf of Alaska, approximately 475 miles west of Graham Island on 3 March 1956

After full and mature deliberation, the Board finds as follows:

#### FINDINGS OF FACT

1. At approximately 1245 (Zone plus 10) on 3 March, 1956, the SS WASHINGTON MAIL, while under way on a course of 275° PGC and 275° True, into a moderately heavy westerly sea and swell, broke in two over an estimated period of five seconds and both halves subsequently sank in the Gulf of Alaska after all sixty persons aboard had been rescued by the USNS GENERAL FREEMAN. At the time of the casualty, the vessel was making approximately 73 RPMs on 18 nozzles and due to the head sea and swell, was making approximately 13 knots over the bottom. At 1315, the dead reckoning position was Latitude 54° 00' North, Longitude 147° 12' West. At 1515, the bow section slowly turned over on its port side and sank in the estimated position of Latitude 53° 58' North, Longitude 147° 00' West. The stern section sank after the abandoning in position Latitude 53° 54' North, Longitude 146° 27' West, at approximately 2118 (Zone plus 10), 3 March, 1956. No persons were lost or more than slightly injured in connection with this casualty.

2. The vessel involved was the SS WASHINGTON MAIL, Official No. 247323, 7943 gross tons, 4672 net tons, 468.5 feet by 69.6 feet by 29.5 feet, built in 1945, at Pascagoula, Mississippi, by Ingalls Shipbuilding Company, as a C3-S-A2 cargo vessel. This vessel was an 8500 horsepower steam turbine driven single screw freight vessel owned by the American Mail Line Ltd., Wilmington, Delaware, with home port of Seattle, Washington. There was an outstanding mortgage to the United States Maritime Commission of the total original amount of \$960,500; this mortgage was entered into on 7 July, 1947, and was due for maturity on 7 July, 1964. Dudley A. Durrant was the master of the vessel. At the time of the casualty, the vessel was in possession of the following valid documents:

(a) U. S. Coast Guard Certificate of Inspection, issued at Portland, Oregon, on 31 July, 1955.

(b) U. S. Coast Guard amendment to the above Certificate of Inspection issued on 1 December, 1955, at Portland, Oregon, covering the annual drydock inspection.

(c) Load Line Certificate issued 16 December, 1954, by the American Bureau of Shipping, due to expire on 31 January, 1959.

3. Weather and sea conditions:

(a) At approximately 2300 PST on 29 February, 1956, the vessel entered the Pacific Ocean from the Strait of Juan de Fuca and after taking departure from Swiftsure Lightship at 2316, the course was set at 295° gyro and true. At this time the wind was southwest, force 4, air temperature was 42° - 43°, sea temperature was 44° and the

vessel was pitching easily to a long low southwesterly swell.

(b) On 1 March, the weather and sea conditions were as follows: Wind direction varied from southwest to west with an average force of between 4 and 5. The air temperature slowly decreased from  $45^{\circ}$  -  $46^{\circ}$  to  $39^{\circ}$  -  $41^{\circ}$  and sea temperature decreased from  $44^{\circ}$  to  $42^{\circ}$ . During the day the speed was occasionally reduced because of a moderate west southwest sea and moderately heavy westerly swell which was increasing and was causing spray and occasional small amounts of water to come over the foredeck.

(c) On 2 March, the weather and sea conditions were as follows: The wind veered from southwest, force 5, in the morning to north northwest up to force 7 at 1400 and steadied down to northwest, force 5, at midnight. Air temperature decreased from  $41^{\circ}$  -  $42^{\circ}$  to  $28^{\circ}$  -  $31^{\circ}$ , and sea temperature decreased from  $42^{\circ}$  to  $38^{\circ}$ . The vessel was pitching easily to a long low southwesterly swell in the morning and also to a long higher westerly swell in the evening.

(d) On 3 March, the weather and sea conditions were as follows: The wind increased in the early morning from northwest, force 4 to north northwest, force 7, but had begun to moderate by 0800, local time, to northwest by west, force 4. At the time of the casualty, the wind was increasing and had reached west northwest, force 6 to 7. Air temperature decreased from  $29^{\circ}$  to  $27^{\circ}$  -  $31^{\circ}$ , and sea temperature was fairly steady at  $38^{\circ}$  -  $39^{\circ}$ . The master of the vessel testified that the worst swell conditions were encountered between midnight on 2 March and approximately 1000, local time, of 3 March, during which time, he estimated that the vessel was heading into a 500 foot swell with maximum height of approximately 35 feet. This swell condition decreased, however, and by noon had shortened to an estimated length of 125 feet with an estimated height of 15 feet. Due to the small changes in course that were effected between departure from Swiftsure and the time of the casualty, the vessel was constantly heading into the sea and swell or had them close to dead ahead on either bow.

(e) At the time of the fracture, the air temperature was  $27^{\circ}$  -  $31^{\circ}$  and sea temperature was  $38^{\circ}$ .

4. At 1454 PST on 29 February 1956, the SS WASHINGTON MAIL departed Pier 88, Seattle. At the time of departure, the draft was 26' 07" forward and 31' 05" aft, with a mean draft of 29' 00". The vessel had a 2° port list. The mean freeboard upon departure was 5' 01". This was the mean between the observed readings of 6' 05" on the starboard side and 3' 09" on the port side, each dimension being taken between the freeboard markings and the water's edge by personal observation of the Chief Mate. Since the Load Line Certificate stated that the vessel had a winter freeboard of 5' 03" and a summer freeboard of 4' 07.75", the mean sailing freeboard was 2" less than the freeboard allowance for the winter zone and 5.25" more than the freeboard allowance for the summer zone. The specific gravity observed at Pier 88, Seattle, on this

date was 1020. The freshwater allowance stated on the Load Line Certificate was 7.5". The freshwater allowance for Pier 88, Seattle, was determined to be 1.5" or 20 percent of the total freshwater allowance. A steam-out allowance of 1" was used in the computations by the cargo surveyor and the Chief Mate for consumption of fuel and water from time of departure from Seattle until the vessel's entry into the winter zone area in the Pacific Ocean northwest of Cape Flattery. The resultant of the above figures gave the SS WASHINGTON MAIL an estimated clearance of 1/2" upon entry into the winter zone. As previously stated, the vessel had a clearance of 5.25" without considering any freshwater allowance, for the summer zone which is governing at Seattle. The U. S. Customs recorded draft on date of sailing was the same as mentioned above.

5. A summary of information which is contained in Exhibits covering the cargo and fluid weights aboard the vessel is hereby stated. The weights given below include all weights in all holds, deep tanks and double bottom tanks and weights of deck cargo in the particular area of the vessel which is mentioned. The figures given below are for the estimated loading condition of the vessel at 1200 (Zone plus 10) on 3 March, 1956. It is assumed as fact that the below stated conditions at this time were almost identical to those which existed one hour and fifteen minutes later or at 1315 when the casualty occurred:

- (a) Forepeak tank - 84 S/T
- (b) No. 1 Hold Area - 2140.5 S/T
- (c) No. 2 Hold Area - 2647.4 S/T
- (d) No. 3 Hold Area - 2336.8 S/T
- (e) Deep Tanks under machinery space - 130 S/T
- (f) No. 4 Hold Area - 2678 S/T
- (g) No. 5 Hold Area - 2361 S/T
- (h) Afterpeak tank - 8.96 S/T

The above figures were computed from all known and recorded information and from studied estimates which were made by the Chief Engineer during his testimony. The tank capacity tables for this vessel went down with the ship and it was necessary to use tank capacity tables furnished by the American Mail Line for similar vessels. Only the rough engineer's log was saved and as stated above the Chief Engineer's testimony had to be taken into account in making these computations.

It is to be noted that the weights stated on the cargo plan, which is enclosed as an exhibit, are in short tons and the weights first arrived at by use of the tank capacity tables were in long tons. The last was converted to short tons, such that the total figures would be in short tons.

6. At approximately 1300, (Zone plus 10) on 3 March, 1956, all 51 crewmembers and the 9 passengers aboard were in the amidship deck house. Since this date was a Saturday, the majority of the crewmembers who were off watch had



turned in and at this time the watch on the bridge, which consisted of the Third Mate and the man at the wheel, and one of the passengers who was taking photographs on the flying bridge were the only persons on board who were looking forward. At 1315, the mate on watch and the passenger both felt the vessel undergo a distinct sagging amidships in conjunction with a loud deep rumbling sound which appeared to emanate from deep down in the vessel in the vicinity of No. 3 hold. Moments thereafter the amidships section of the vessel appeared to rise on a swell and then to immediately sag again, and upon completion of the three above-described motions over an estimated period of five seconds, the vessel was separated into two parts. The first loud deep rumbling sound was followed by two sharper sounds which appeared to be very close together. The vessel had parted in the vicinity of the after end of No. 3 hatch coaming. The Master, who had been in his cabin immediately below the bridge, dashed to the bridge, stopped the engines and immediately placed them on "full astern." During the period that he was rapidly proceeding to the bridge from his cabin one deck below, the mate sounded the general alarm. The Master immediately took over the conn, and after assuring himself that collision between the after and forward parts of the vessel did not appear likely, reduced the speed of the engine and proceeded to back the stern section into the wind at a very slow speed. Before he could complete this maneuver, the plant was lost until about 1430 when the Chief Engineer was able to again get it in operation. The fires in the boilers had been drawn by the watch below shortly after the casualty at 1315 and circuit breakers on the main board had opened due to the break in wiring to No. 3 lower 'tween deck reefer boxes and the forward ventilation system. The circuits were energized at that time. The engine was stopped to prevent complete loss of steam in the boilers. The three distinct sounds were described by a number of witnesses. Their testimony varied from sounds which were positively identified as that of explosions to those which sounded like deep rumbling shocks. Various of the witnesses interviewed testified to the presence of smoke for a brief period of time; which smoke was described by some as smelling like cordite and gunpowder. Other witnesses testified that the smoke smelled like burning electrical wiring. The mate on watch and the passenger on the flying bridge both stated that the bow of the vessel was into a moderately heavy swell at the moment of the first sound. These two persons also testified that their impressions were that the port side of the main deck separated first and that the starboard side of the main deck separated last. The mate on watch gave a very vivid description of the forward section of the vessel appearing to rise very high, in his estimate, above the after section, in conjunction with the first sound, and then settling and completely breaking away on an apparently even keel and with a slight list to port. All witnesses interviewed stated that immediately after the separation the stern section appeared to settle by its stern and that this angle was maintained until shortly before the abandoning. Other than what has been stated above, there was no additional information received concerning the term "explosion" or concerning the existence of any fire in either of the two sections of the vessel.

7. Immediately after the separation, the Master mustered all hands at their boat stations with life jackets, and after receiving a report from the engineroom decided that it was safe to delay abandoning the vessel and, perhaps, be able to save the after end from sinking. With this in mind, the Chief Engineer took practically his entire crew below and the plant was again placed in operation and pumping was begun because of a small leak on the port side of the bulkhead between No. 3 hold and the forward part of the fireroom and at the level of the first platform. This leak was easily controlled by the pumps, and the amount of water entering the engineroom appeared to be intermittent because the leak appeared to open and close as the vessel worked in the seaway. The leak on the port side appeared to be in way of a welded seam, in the locations previously mentioned. This crack was estimated at approximately 18 inches in length on the port side of bulkhead 102. Shortly after the plant and pumps were again in operation, a heavy banging sound was heard to occur on the starboard side of bulkhead 102, at about the level of the platform deck which was approximately 8 feet above the tank tops, and the entire bulkhead appeared to shake from the force of an unknown object which appeared to be striking the No. 3 hold side of the bulkhead.

8. The Radio Officer, who was in the radio shack at the time of the casualty, was ordered by the Master to send out a distress message on 500 kcs. approximately one minute after the casualty occurred. Due to the fact that his main antenna had been torn down by the separation of the vessel, an emergency antenna had to be rigged, and after numerous unsuccessful attempts the first radio contact was made with the USNS GENERAL FREEMAN, at approximately 1439, zone plus 10 time. The information from the FREEMAN was that she was approximately 65 miles southeast of the casualty position and her estimated time of arrival was stated as being approximately 1845 on 3 March, 1956. The USNS GENERAL FREEMAN made radar contact with the stern section of the vessel at a distance of 18 miles at 1848, on this date.

9. At approximately 1515, the unidentified object which was pounding against the starboard side of the bulkhead at frame 102 opened a hold in the bulkhead in the vicinity of the lower 'tween deck level. This opening, which was merely a crack at first, ultimately opened to a size of approximately one foot square, with part of the bulkhead plating being bent back into the engineroom. All efforts to stop the flooding from this source, by the use of stuffing material and wedges that were placed in the opening, was of no avail. The Chief Engineer did not desire to use shores, since the only object against which he could place the shore was the side of the boiler, and he was afraid of opening a hole in the boiler with the danger of fire, or, possibly, live steam escaping into the area. All available pumps in the engineroom, including the bilge pump, the main circulator and the emergency injection pump were used in attempting to keep ahead of the influx of water.

10. After establishing contact with the FREEMAN, the Master and Chief Engineer had planned to attempt to keep the stern half afloat as long as possible, and if it appeared safe to do so, to attempt to bring the stern half into port.

After it became apparent, because of the opening on the starboard side of the bulkhead, that difficulty was being experienced to a greater degree with the influx of water into the engine room, plans were made to abandon the vessel upon arrival of the GENERAL FREEMAN in the vicinity of the after end of the WASHINGTON MAIL. At approximately 1900, the Chief Engineer had to abandon the engine room because the pumps could not keep up with the water which had then risen above the top of the floor plates and had begun to extinguish the fires in the boilers. At approximately 1900, No. 2 boat was launched, and at approximately 1903, No. 1 boat was launched. All of the 51 crewmembers and 9 passengers were safely debarked in these two lifeboats. Shortly thereafter, all persons in the two boats were successfully taken aboard the USNS GENERAL FREEMAN without serious injury or loss of life under the steadily worsening weather conditions.

11. The stern section of the vessel disappeared from the radar scope of the USNS GENERAL FREEMAN at approximately 2118, zone plus 10 time. All passengers and crewmembers were debarked from the GENERAL FREEMAN at Kodiak, Alaska, and returned to the United States by air.

12. The testimony of various witnesses and one of the enclosed photographs establishes that the after section of No. 3 hatch coaming remained with the after half of the vessel. The port and starboard sides of the after part of the hatch coaming at No. 3 hatch were bent slightly aft on either side and there was a fracture in the center of the vertical portion of the hatch coaming. The fracture on the weather deck apparently ran directly along the after section of the hatch coaming at No. 3 hatch or at Frame 90, and appeared to continue from the after port corner of the hatch, directly across the main deck to the side of the vessel. Due to some of the deck cargo of lumber which remained aboard and obscured this portion of the fracture, positive information could not be obtained. The nature of the separation on the starboard side of the weather deck in the vicinity of the after end of No. 3 hatch was that the separation extended rather sharply aft, from the after starboard corner of No. 3 hatch coaming at Frame 90, toward the forward edge of the deck house. Testimony concerning the fracture down the starboard side indicates that the crack ran in a wavy but jagged line which tended generally slightly aft towards the waterline. It is estimated that this fracture reached the bottom somewhere between Frames 90 and 95 on the starboard side. There was little information ascertainable as to the direction of the shell fracture on the port side, except that it appeared to run almost vertically. The deck and side shell fractures were jagged, particularly on the starboard side. Whether the separation boundary on the starboard side of the weather deck was also the fracture line could not be established.

13. The Board was unable to ascertain any information which could lead to a positive statement of fact as to the origin of the fracture. Testimony indicated that the bottom section of the vessel appeared to have separated first but it appears that the fracture may have started anywhere along the separation boundary. Further testimony was to the effect that the port side of the shell and weather deck separated first, and the starboard side of the shell and weather deck separated last.

14. The SS WASHINGTON MAIL had been continuously under the operation of the American Mail Line since July, 1947. At that time, welded doublers were installed on the sheer strakes while the vessel was being changed to a shelter deck vessel. Enclosed exhibits give the details of this installation. No information was obtained concerning any casualty that the vessel might have suffered between her date of build, in 1945, and July 1947. However, neither the Master nor the Chief Engineer, who were present in 1947 when the vessel was taken over, had any recollection of any information concerning serious casualties during those two years. The most serious casualty suffered by the vessel between 1947 and the date of sinking was a grounding while in a fully loaded condition, in February 1949, at Marrowstone Point, Puget Sound, Washington. Extensive bottom repairs, in way of double bottom tanks under No. 3 hold, the engineroom spaces and No. 4 and No. 5 holds, were made as a result of damage received during this grounding. Lacking any information to the contrary, the Board is stating as fact that such repairs were properly made, as evidenced by the Coast Guard and American Bureau certificates which have been issued since 1949. In 1954, an 18 foot gash was received on the port side, extending from vicinity of Frame 92, aft into the engineroom, at the upper 'tween deck level, when the vessel was blown bodily against a pier in Cebu during a typhoon. This damage was permanently repaired overseas under the supervision of an A.B.S. inspector, and the repairs were approved after return to the United States by both Coast Guard and A.B.S. inspectors. Lacking any evidence to the contrary, it is stated as fact that these repairs were properly made. In 1954, a small fracture at the port forward corner of the amidship deck house on the weather deck was veed and rewelded. In April, 1955, the forward starboard corner of the amidship deck house at the weather deck level was found to have a 24 inch fracture in way of Frame 95, and this fracture was veed and rewelded. No information other than that stated above was adduced by the Board concerning any cracks or fractures in any of the vessel's structure, from 1947 until 1956. All witnesses who were interviewed stated that they had no personal knowledge of any fractures other than those stated above.

15. In accordance with common practice aboard vessels which customarily carry deck cargoes of lumber, this vessel had numerous cargo lashing pads and square-shaped sockets for stowage timbers welded on the main deck for lashing of such deck cargo. The total number of such lashing pads and sockets was not established since they were added in various locations on the weather deck from time to time in order to properly lash deck cargo. Various key witnesses were questioned as to whether it had been necessary to renew any welding on these pads or sockets because of small fractures. Testimony was received that there was recollection of welding of the vertical portions of the square sockets but no recollection of any welding that was necessary on the bases of the pads or sockets where they were connected to the weather deck. The Chief Engineer testified that never in his knowledge had any members of the crew done any welding on any part of the structure of the vessel and, further, that any welding on any part of the structure had been done in shipyards under the supervision of the Coast Guard and American Bureau of Shipping Inspectors.

16. The Board adjourned on 16 March, 1956, subject to call for future proceedings for the purpose of checking the evidence and primarily to review and take cognizance of the following documents:

(a) The Design and Method of Construction of Welded Steel Merchant Vessels, dated 15 July, 1946

(b) The Third Technical Progress Report of the Ship's Structure Committee, issued 1 August, 1953.

(c) The article entitled Research Under The Ship's Structure Committee as published in Vol. 60, 1952 of Transactions of the Society of Naval Architects and Marine Engineers, and the further comments made by various authorities on this article.

(d) All other available information concerning the nature of the ship fractures in welded steel vessels.

17. Upon interview, the Chief Engineer stated that the fuel oil in the settlers was at a temperature of between 120° to 126° at the time of the casualty. The settling tanks are located in the forward starboard and port corners of the machinery space and extend above and below the water line that existed at the time of the casualty. The shell of the vessel on either side forms the outboard sides of the settlers. The Chief Engineer further stated that it was customary on the westbound trip to heat the fuel oil but that on eastbound trips lighter oil, which was taken overseas, was used and it was not necessary to heat that oil.

18. No persons were killed or lost and no persons were injured other than superficially in connection with the casualty, the abandoning of the after end of the vessel, or the rescue by the USNS GENERAL FREEMAN. The damage suffered in connection with the total loss of the vessel was estimated at two million dollars. The damage suffered in connection with the total loss of all cargo was estimated at two million dollars.

19. The Master and the Chief Engineer publicly praised the conduct of the entire crew. The Master, Chief Engineer, and the Chief Mate and other deck officers stated that all lifeboat equipment worked in excellent fashion. Strong recommendations were made by the Master, Chief Engineer, and Chief Mate that all cargo vessels be equipped with motor lifeboats because it was their opinion that lives may have been lost had the WASHINGTON MAIL not been equipped with motorboats. They gave as their reason for this the extremely numb and practically helpless condition of most of the persons in the boat at the time of rescue alongside the GENERAL FREEMAN and attributed such conditions to freezing spray and low temperature. Recommendations were also made that all lifeboats be equipped with spray shields to reduce the effect of wind and spray at low temperatures. The Chief Engineer made a strong recommendation that permanent cross-connection arrangements be made in the engine rooms of this type of vessel such that all pumps could readily and easily be used to

discharge water from the engineroom. The Radio Officer stated that he had to fabricate an emergency antenna from wire which had not been previously cut to the proper length for the distress frequency and that the availability of a properly cut and arranged emergency antenna would have greatly shortened the time interval between the casualty and the first distress signal that he was able to send out. The testimony of unlicensed personnel and the junior officers was in complete agreement that the Master and the Chief Engineer maintained complete discipline and control and performed admirably during the entire period from the time of the casualty at 1315 until the abandoning of the vessel at approximately 1900.

#### OPINIONS

20. The Board therefore is of the opinion that:

a. At approximately 1315, Zone plus 10 time, on 3 March, 1956, the SS WASHINGTON MAIL while underway on a course of 275° True into a westerly sea and swell, broke into two parts over an estimated period of five seconds, and both halves subsequently sank in the Gulf of Alaska after all sixty persons aboard had been rescued by the USNS GENERAL FREEMAN. At the time of the casualty, the vessel was making approximately 73 RPM on 18 nozzles, and due to the head sea and swell was making approximately 13 knots over the bottom. At 1315, the dead reckoning position was 54° 00' N. and 147° 12' W. The bow section sank in estimated position 53° 58' N., 147° 00' W. at approximately 1515, Zone plus 10 time, on 3 March. The stern section sank after the abandoning in position 53° 54' N., 146° 27' W., at approximately 2118, Zone plus 10 time, on 3 March, 1956.

b. The total loss of the vessel is estimated at approximately \$2,000,000. The total loss of the cargo is estimated at approximately \$2,000,000. No persons were killed or lost, or more than superficially injured, in connection with the casualty, the abandonment, or the rescue operations by the USNS GENERAL FREEMAN.

c. The SS WASHINGTON MAIL was loaded in a satisfactory fashion in accordance with accepted standards, and her draft, trim and list upon departure Seattle on 29 February, 1956, and at the time of the casualty, 3 March, 1956, are considered to be satisfactory.

d. Although sea conditions were moderately rough, no evidence has been adduced which would indicate that the vessel was being unduly driven into a head sea or being subjected to other than normal stresses and strains due to sea and swell. The sea conditions existing at the time were normal for the time of year in the area of the casualty.

e. All evidence adduced points to the cause of the casualty as being solely a complete structural failure in the vicinity of frames 90-95, which failure almost immediately resulted in the separation of the vessel into two parts.

f. The identity of the heavy object which was pounding on the forward side of bulkhead at frame No. 102 and which ultimately punched a hole on the

starboard side of this bulkhead, could not be ascertained. It is believed that it may have been some part of one of the reefer boxes in No. 3 lower 'tween deck. This hole and the ensuing flooding caused the sinking of the after end.

g. The definite starting point of the fracture could not be ascertained, and it appears probable that it will never be ascertained. However, probable starting points which appear likely are:

(1) Connection of the bilge keels on either side of the vessel in way of No. 3 hold.

(2) Failures in either hatch corner at the after end of No. 3 hatch.

(3) Possible commencement in way of a discontinuity in the shell plating on the vessel's bottom beneath No. 3 hold.

(4) Minor unnoticed fractures on the weather deck in way of cargo lashing pads and sockets which were used for vertical square shoring members in the stowage of deck cargoes of lumber.

(5) Discontinuities near the top of the sheer strake at the weather deck edge on either side, such as scupper drains in way of No. 3 hatch weather deck area.

(6) Radical differences in temperature of the shell plating in way of and just forward of the fuel oil settlers which were heated to between 120° - 126° Fahrenheit, may have introduced a discontinuity in the strength of the shell forward of the bulkhead at frame No. 102.

h. There was no evidence of negligence or misconduct on the part of any persons aboard the SS WASHINGTON MAIL at the time of the casualty. In contrast, there was much testimony concerning the excellent performance of duty, of maintenance of discipline and attention to duty under most difficult circumstances. In particular, the Master, Dudley A. Durrant, and the Chief Engineer, Earl D. Bostick, exhibited commendable performance during a time of great distress.

i. At the time of the casualty there were no outstanding requirements against the vessel from either the U. S. Coast Guard or the American Bureau of Shipping.

j. The facts adduced in this case lead the Board to feel that it is a matter of utmost urgency that immediate steps be taken to rectify the situation which is believed to exist in the structure of C-3 type cargo vessels. It seems apparent that the steel of which these vessels were built, at least through 1945, is notch sensitive and must have a relatively high transition temperature. In this connection the Board feels that previous standards which were widely accepted throughout the marine industry as to the meaning of the term "seaworthiness," as applied to vessels of this class, must be modified unless immediate steps are taken to strengthen the structure of these vessels.

## RECOMMENDATIONS

21. In making the following recommendations, the Board is taking into consideration the informed conclusions based upon research, which were made under the Board of Investigation and by the Ship's Structure Committee, concerning crack arrestors. The Board further feels that the term "crack arrestors" should not include welded doublers which may only add to thickness of plating and have no effect upon the arresting of any cracks which may start, but should be limited strictly to slotted plating which is covered with riveted doublers.

22. The Board therefore recommends that:

a. The Commandant consider requiring the immediate strengthening of all vessels of this class by the fitting of the same with appropriate slotted and riveted crack arrestors and such other reinforcement of the hull girder as is deemed necessary in order to prevent similar casualties in the future.

b. The Commandant consider the issuance of letters of commendation to the Master, Dudley A. Durrant, and the Chief Engineer, Earl D. Bostick, for their performance under most difficult conditions. The Commandant consider issuing a letter of commendation to Captain Robert T. FULTON, USNS GENERAL FREFMAN, for the rescue operation under difficult conditions.

c. The Commandant consider recommending to the F.C.C. that all vessels be required to have an emergency antenna properly stowed and protected from the weather and properly cut for the distress frequency of 500 kcs., such that it can be installed for immediate use in a minimum period of time. In this connection it is felt that had the WASHINGTON MAIL been flooding in the engineroom shortly after the casualty, the vessel may have gone down without any distress message having been transmitted due to the lack of a proper antenna.

d. The Commandant consider requiring more questions concerning damage control on both deck and engineer officer license examinations.

23. Other than as stated above, no further action be taken and this case be closed.

(signed) Arthur L. Dickert  
ARTHUR L. DICKERT  
Captain, United States Coast Guard  
Chairman

(signed) George C. Streng  
GEORGE C. STRENG  
Commander, United States Coast Guard  
Member Reserve

(signed) William C. Foster  
WILLIAM C. FOSTER  
Commander, United States Coast Guard  
Member and Recorder



The Board then, at 12:00 noon, Tuesday, 24 April, 1956, adjourned to await the action of the convening authority.

(signed) Arthur L. Dickert  
ARTHUR L. DICKERT  
Captain, United States Coast Guard  
Chairman

(signed) William C. Foster  
WILLIAM C. FOSTER  
Commander, United States Coast Guard  
Member and Recorder