The Case for Why There Was Sufficient Lifeboat Capacity for All Aboard Titanic on April 14-15, 1912

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Introduction

I suspect that some will have read the title of this article more than once. The opposite declaration has been made so many times that to suggest otherwise might seem outrageous. In this article I will attempt to make the case stated in the title. The lifeboats having the capacity to hold all aboard Titanic will be the easiest part to prove. The procedure to accomplish the loading of all aboard is considerably more difficult. The aspect which would be nearly impossible to accomplish would be changing the will of the crew and passengers to actually carry out the plan.

If the Titanic disaster happened 100 times, there is no reason to believe anyone would have acted in a way which would have materially changed the outcome. Even if an identical disaster had befallen Olympic after the Titanic disaster and she had the same numbers and types of lifeboats and it was known what mistakes had been made during the loading of Titanic's lifeboats, I believe that the performance of the crew in loading the lifeboats would only have been marginally better. There is a natural inclination to adhere to conventional procedures. Taking a chance with thinking "outside the box" is resisted even in the face of death.

To facilitate this discussion, I am going to propose an entirely fictional story which would, if it were true, overcome the problem of the mindset of the crew. There is no chance it would ever have happened but fiction is the only way the crew mindset could be overcome. I will put forth this fictional account first.

A Different Captain Smith

Edward J. Smith was always a precocious officer as he was rising through the ranks of the White Star Line. He was not content with understanding what procedures needed to be performed to meet any challenge but why that particular procedure was preferred. He was always looking for better ways of doing things. By the time he assumed his first command, he was very much aware that he bore the ultimate responsibility for his vessel and all aboard. Of particular interest to him were lifesaving procedures. It didn't require much insight for him to see that ships of the day were underequipped to be able to provide lifeboat provision for all aboard.

Over the years during his various commands, he tried to influence White Star to increase their lifeboat complements to provide for all aboard. His appeals fell mostly on deaf ears due to the cost considerations and the prevailing notion that ships were now beyond catastrophe. When the Olympic class was being built he realized that he would command the first of the class, Olympic. Not being able to influence an increase in the number of lifeboats while Olympic was being built, he began to formulate a bold back-up plan to maximize the number of lives which could be saved in a catastrophic disaster.

Smith first studied the types and numbers of lifeboats which would be installed aboard Olympic. He concluded that with the right operational plan that the lifeboats could be treated as life rafts. Without the men and equipment necessary for maneuvering, he reasoned that the number of persons the boats could hold could be increased dramatically. With this technical information in hand, Smith developed an operational plan for loading boats during a disaster. He instructed and drilled his officers to execute this plan should it ever be needed. It was never needed until the maiden voyage of his second Olympic class command, Titanic.

The foregoing account of Captain Smith is entirely fictional. For the purpose of this article I will ask the reader to suspend disbelief and assume that it is true.

Numbers of Passenger and Crew

The numbers of passengers and crew has been the subject of considerable debate over the years. The numbers which I will use for this article may not be accurate according to the most recent information but if the numbers are not exact, they are only in error by a few people one way or the other. This potential error will not affect the calculations or conclusions in this article in any material way. The following is the enumeration of passengers and crew by men, women, and children. The people on board will not be separated as to whether they were passengers or crew.

Total men – 1680 with an average weight of 160 lb.

Total women – 434 with an average weight of 120 lb.

Total children – 112 with an average weight of 60 lb.

Total passengers and crew – 2226

Lifeboats

The complement of lifeboats aboard Titanic consisted of the following with their principal dimensions:

14 wooden boats – 30 ft. length x 9 ft. breadth x 4 ft. depth

2 wooden cutters – 25 ft. length x 7 ft. breadth x 3 ft. depth

4 Engelhardt collapsible boats – 27.5 ft. length x 8 ft. 6 in. breadth x 3 ft. depth

The Board of Trade regulations regarding the required lifeboat capacity for the ship was based on the total cubic ft. capacity of all the boats combined. Titanic not only met but exceeded the

Board of Trade requirements of the time. The adequacy of the Board of Trade requirements will not be discussed in this article. The cubic ft. capacities of the boats will be used to determine how many persons beyond the normal capacity could be loaded into any boat type.

Lifeboat Capacities

The cubic ft. capacity of each boat was determined by multiplying the length times the breadth by the depth. This figure was multiplied by a compensating coefficient of 0.6 to give the total cubic ft. capacity of the boat. The capacity of each boat type was as follows:

30 ft. boat - 30 ft. x 9 ft. x 4 ft. x .6 = 648 cubic ft.

25 ft. boat - 25 ft. x 7 ft. x 3 ft. x .6 = 315 cubic ft.

Engelhardt collapsible – Cubic ft. capacity was not calculated for the decked lifeboats. The square footage of the deck was calculated and a certain square footage was allowed for each passenger. The passenger capacity of the collpasibles was rated at 47 persons per boat by the Board of Trade.

Weight Capacities

The weight any individual lifeboat could hold is found by the equation, (total cubic ft. capacity x weight of a cubic ft. of seawater) – weight of the boat. Since water would enter the boat amidships over the lowest part of the gunwale before it could be loaded to absolute capacity, a safety factor will be introduced into the weight capacity by multiplying the total weight capacity by 0.8. The weight capacities of the individual boats using the equation given above are:

30 ft. boat – (648 cubic ft. x 64 lb. /cubic ft.) – 5,000 lb. = 36,472 lb.

Safety adjusted capacity = 36,472 lb. x .8 = **29,177 lb.**

25 ft. boat – (315 cubic ft. x 64 lb. /cubic ft.) – 4,166 lb. = 15,994 lb.

Safety adjusted capacity = 15,994 lb. x .8 = **12,795 lb.**

Engelhardt collapsible – The weight capacity is unknown because the method for determining the passenger capacity of the collapsibles was different as described above. The passenger capacity was rated at 47. In the next section it will be demonstrated that the capacity could be increased considerably when the demonstrated weight capacity is taken into account.

Lifeboat Loading

With the individual boat capacities calculated we will now try to determine a way of loading the boats to accommodate all passengers and crew. There is likely a more elegant way of accomplishing the loading of the boats than the way I will outline. The purpose of this article is merely to show that the boats could have theoretically held all aboard. Before discussing the loading of the individual boats I will give a few guidelines I followed in determining a loading procedure. These broad guidelines were:

- Lifeboats would be lowered with only four crewmen aboard to the water.
- Persons would be loaded into boats at the two aft E deck gangway doors and the two forward D deck gangway doors. Boats on the water would be roughly 20 ft. below the D deck doors and roughly 10 ft. below the E deck doors.
- Women, children and elderly or infirm men would be loaded first into boats.
- The 25 ft. cutters would tow loaded boats approximately 25 yards abeam of the ship.
- The boats carrying able bodied men would be towed at less than their final loading. Additional men would be ferried to these boats by the 25 ft. cutters.
- Once in place, the boats would be tied together to maximize stability.
- Identical procedures would take place on both port and starboard sides so that after the ship sank there would be two groups of 10 boats.
- The boat groups would remain on station tied together until rescue arrived.

With these broad guidelines in place I will turn to the actual arrangement of people within the boats within the guidelines above. Individual boat types will be discussed and illustrated. They will be discussed roughly in the order in which they would be loaded.

30 ft. boats with women and children

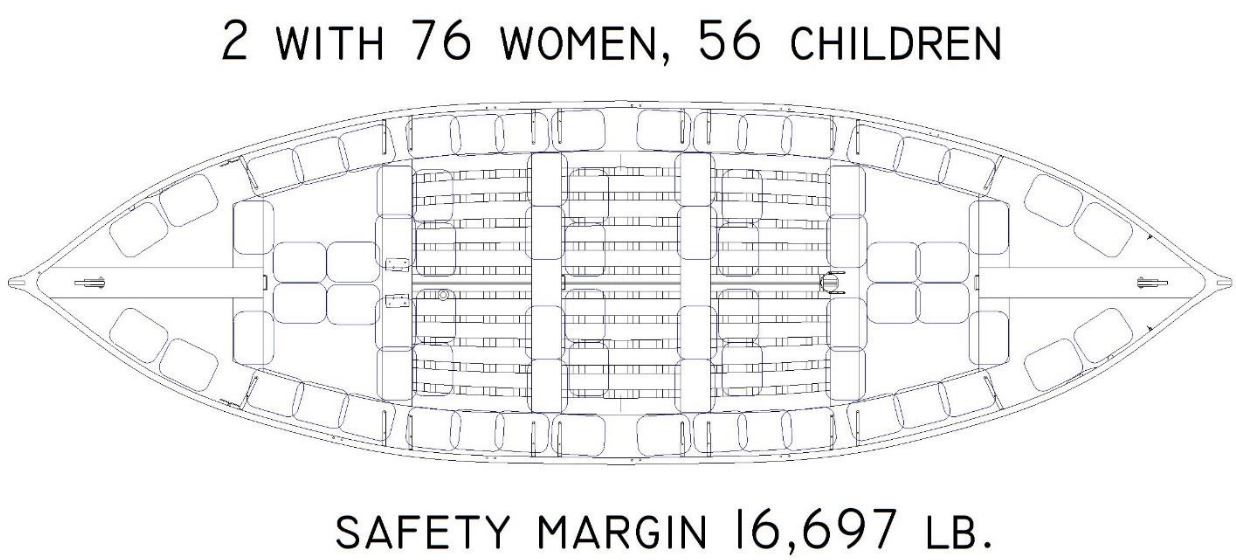

Fig. 1

In these two boats all the children and about a third of all women aboard could be loaded. The outlines for the seating of the women are indicated in Fig. 1. For the women seated on the benches and thwarts, their children for the most part would be seated on their laps. Women with more than one child would be seated on the floor boards with their children forward of them. All aboard these boats would be seated. The total weight of the occupants from the averages for each boat would be (76 x 120 lb.) + (56 x 60 lb.) = 12,480 lb. The safety adjusted capacity for this boat is 29,177 lb. If the actual loaded weight is subtracted from this capacity, we have a safety margin of 16,697 lb.

Engelhardt collapsibles with all women

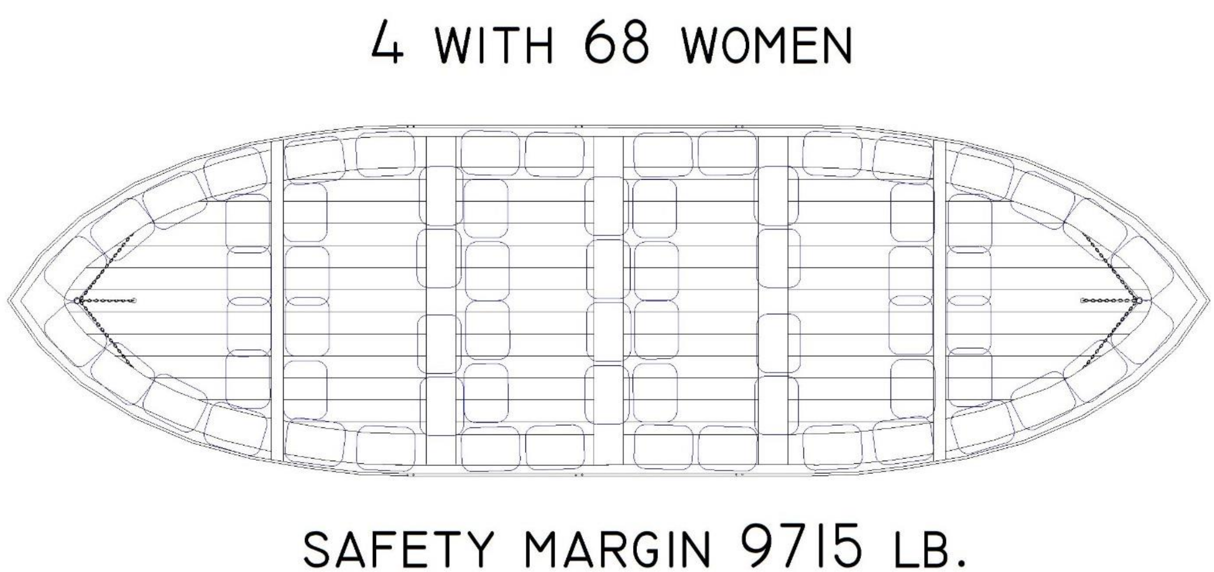

Fig. 2

The Engelhardt collapsible boats shown in Fig. 2 would hold nearly all the remaining women on board. The loading of these four boats with 68 women per boat is shown. All occupants are seated. Since the capacity calculations for these boats is somewhat imprecise I want to illustrate how buoyant they were.

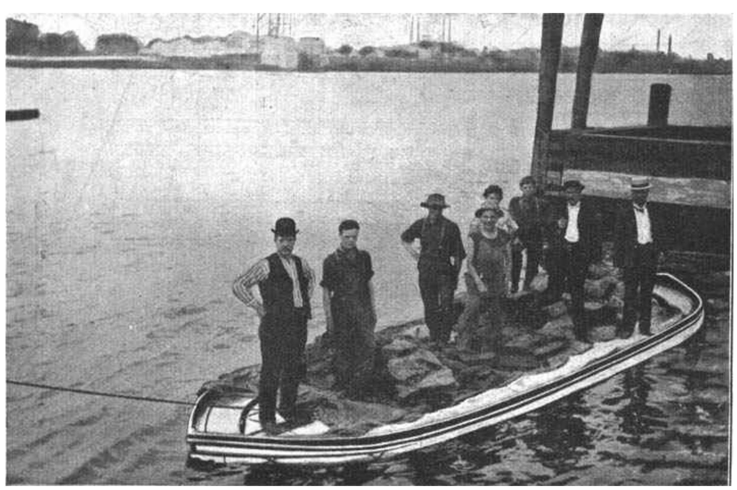

Fig. 3

Fig. 3 shows a 20 ft. Engelhardt collapsible with the sides lowered. This boat is loaded with 8,800 lb. of sand bags. Titanic's Engelhardts were 27.5 ft. boats which would have more capacity than the 20 ft. boat shown in Fig. 3. The loading of 68 women in one of Titanic's 27.5 foot boats would be 8,160 lb. This would be even less than the loading of the 20 ft. boat shown in Fig. 3. Therefore there would be an adequate safety margin for the loading of the Engelhardt boats.

30 ft. boat with men and women

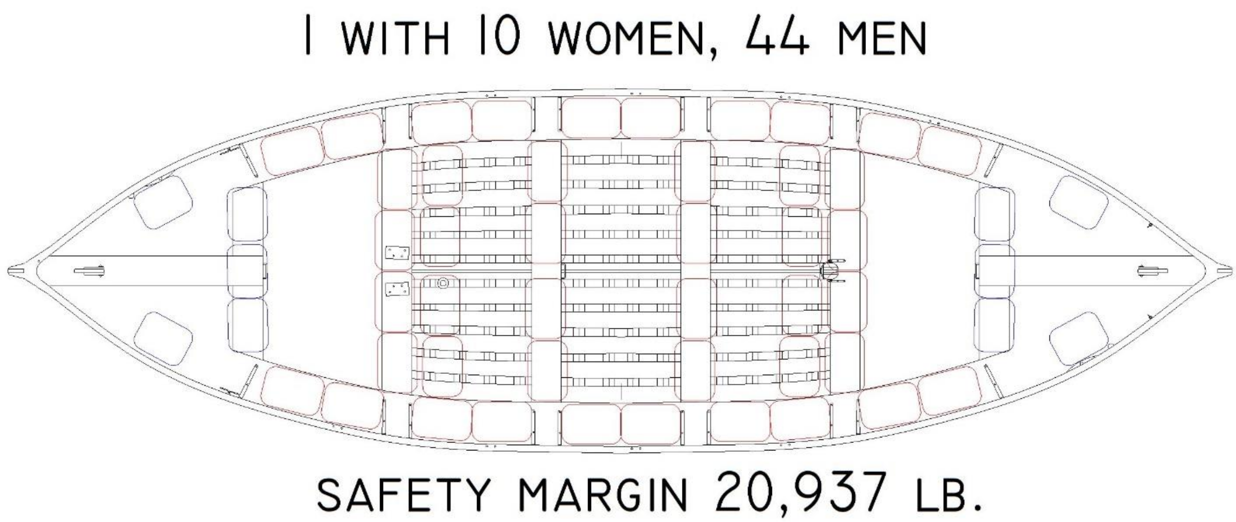

Fig. 4

One 30 ft. boat would be loaded with women and elderly or infirm men as shown in Fig. 4. It is difficult to know how many men might be in this category. Since this is one of the lightest loaded boats it could be used as an overflow to relieve some of the other boats if necessary.

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30 ft. boat with all men

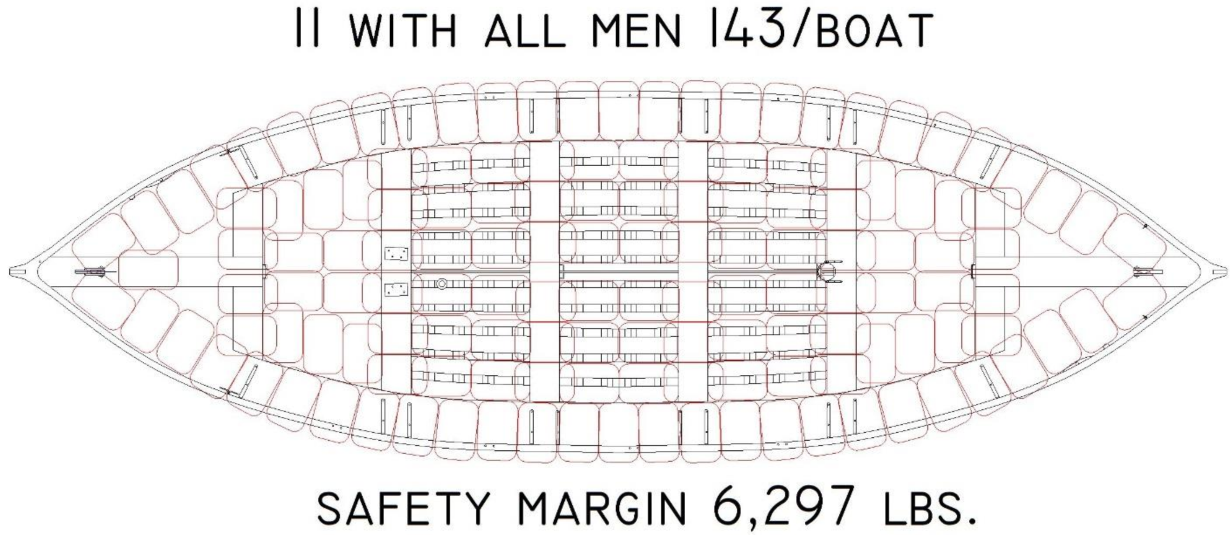

Fig. 5

The 30 ft. boat shown in Fig. 5 represents the heaviest loading of all the boats. These boats would be loaded as heavily as possible with all seated then towed by one of the 25 ft. cutters to the rendezvous point of the boats. It would then be tied to the other boats then the men would all assume standing positions on the side benches, thwarts, and floor boards. The 25 ft. cutters would continue ferrying men to these boats until they had reached capacity. All the men aboard would be the most able bodied on board. The men of the crew would make up a large proportion of these boats. Since these boats have the heaviest loading and all are standing, they would be placed in the interior of the lifeboat group so there would be other boats flanking them for safety. One might question the ability of the men on board to remain standing for hours. Men on the sea have withstood much greater hardship than this. With that being said, it is difficult to overestimate the resourcefulness of people in extreme situations. It would not surprise me if once aboard that all the men could find a sitting position by some means. Even if they couldn't all be seated, I offer the photo below of a Lundin collapsible boat heavily loaded to show how men can accommodate crowding.

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25 ft. boats with all men

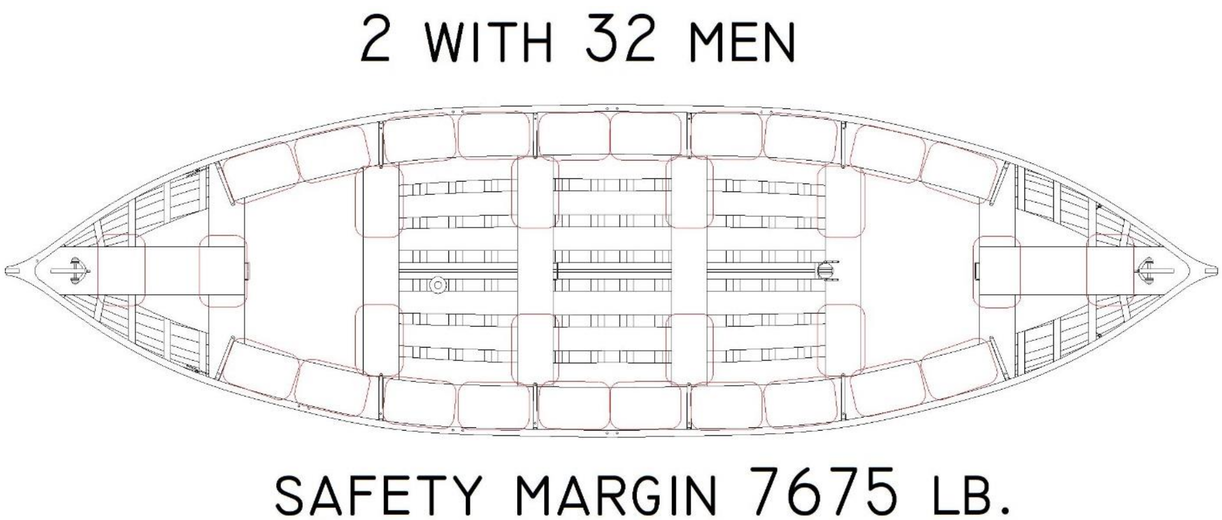

Fig. 6

The 25 ft. boats shown in Fig. 6 would be the “workhorses” in this plan. Initially they would have a crew of 6 with four of them rowing. This boat would be used to tow the others to their loading location then to the boat rendezvous point. After the nine boats had been taken to the rendezvous point, additional men would be ferried by these 25 ft. boats to the boats with all men to increase their loads to the capacity in this plan. After the final pickup from the ship the boat’s load would be increased from 6 to 32. This would still allow the oars to be used so this boat could go to any other boat’s assistance if need be.

Lifeboat Rendezvous

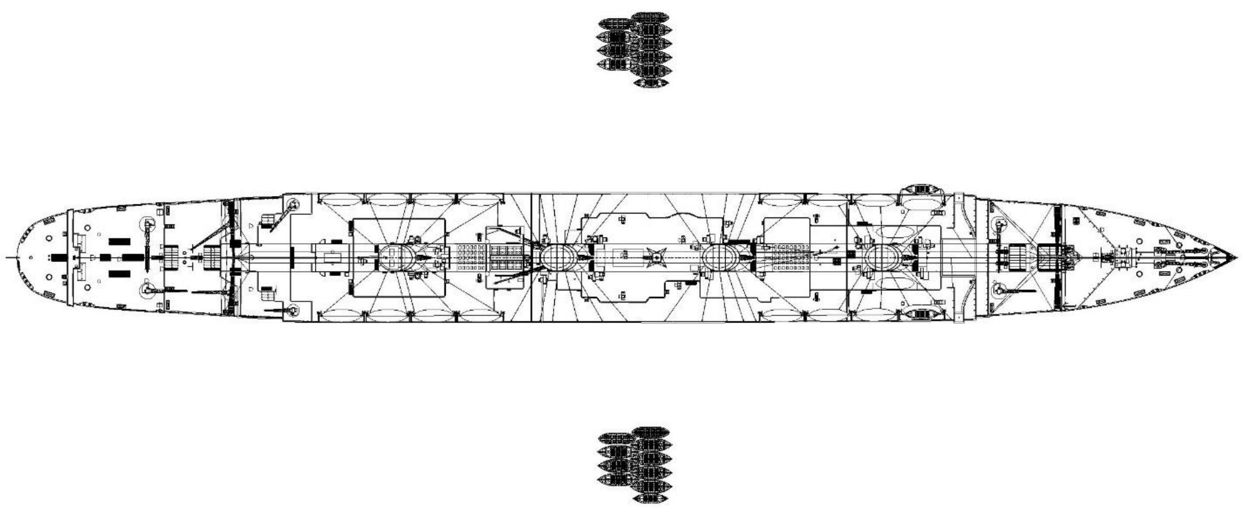

Fig. 7

Fig. 7 shows the rendezvous points of the port and starboard boats. The boats are gathered 25 yards abeam of the ship. This distance is far enough away to be outside the radius of a falling funnel yet just a few boat lengths away from the loading points to accommodate short times for ferrying boats out to this point. As the boats are gathered at these points, they are tied closely to one another. By doing this, greater stability is introduced. The heavily loaded 30 ft. boats would be placed in the interior of the formation so that they are flanked by other boats. This way if someone were to fall overboard from the heavily loaded boats it would be more likely that they would either fall into an adjacent boat or so close that they could be quickly rescued. The intent of this plan is that the boats would stay in place until rescue ships arrive. Thanks to wireless communication, they knew that rescue would only be a matter of a few hours away. The very calm conditions of that night would have improved the safety of conditions aboard the boats.

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Summary

In this article I have endeavored to show that given the numbers of persons aboard Titanic, the equipment available, and the conditions that night that it could have been possible for all aboard to find a place in a lifeboat if they were used as life rafts. The plausibility of the plan is for the reader to decide. The likelihood of the plan being implemented is next to nil. This is a plan which would have to be meticulously planned before the fact. Officers and the men under their command would have to know the plan and be drilled in its operation. Every passenger and crewman would have to know exactly where to proceed if the order to abandon ship were given. Additionally, the plan could only be used if sea conditions were relatively calm and the ship were sinking on a fairly even keel as it did.

The problem with disasters of this magnitude is that when they happen for the first time they are utterly unanticipated and thus there is no adequate plan to deal with them. That is why I proposed a fictional description of Captain Smith where he did think about the unthinkable. Unlike on the night of the Titanic disaster, the Captain and all those in authority would have to make it absolutely clear that the ship would sink in a short time and that everyone should receive orders and behave as if his or her life depended upon it because it did.

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