Design flaws on the titanic

The sinking of the Titanic is one of the most well known sea disasters to date. It has had numerous songs, movies, books, and even a cruise planned in its honor. There were 2340 people aboard the ship when it set sail across the Atlantic on its maiden voyage. When it sank, there was a total loss of life of 1635 people (Myers 17) Not only are there several theories about the cause, there are several changes that came from the sinking of the Titanic that range from modifying the designs of the ships, regulations on type of materials used, and better laws and regulations for safety and communications. This disaster has affected the world as a whole, as there were people from different countries and social status that lost their lives in the disaster.

In 1904, Trans-Atlantic British ships were all fitted with the radio equipment created by Guglielmo Marconi. The operators for these were previous operators from railroad lines and the postal telegraph. In England, the general call on land lines was “ CQ”. When the wireless progressed to sea this became “ CQD” signifying “ CQ” general call, “ D” distress. The Titanic first used “ CQD” with the Titanic’s call letters “ MGY”. Later, they would use this interspersing it with the newly created distress code of “ SOS”. (McEwen)

When the Titanic set sail it was equipped with the best available ‘ electrical generators and radio equipment for the wireless by Marconi Company. Which was the dominate provider of radio equipment and operators. It had 5 kilowatt motor generator with an emergency generator and batteries. The radio had a guaranteed range of 250 miles under any weather and could maintain communications over 400 miles. The antenna was four wires

stretched between two masts with a height of 205 feet above sea level. This was fed by four individual wire feed lines.' (Johnson)

On the night of the 14th, the two operators, Jack Phillips and Harold Bride, were going through the backlog of communications due to radio equipment problems. The first message received mentioned ice. By 9: 30PM, they had received various reports of the dangerous ice. They only responded with " Thanks" and continued on. By 10: 55, the Californian said that they were stopped and surrounded by ice and they were told to shut by Phillips, and that they (the Titanic operators) were busy with Cape Race. (Cape Race Wireless in Newfoundland). However, Captain Edward J. Smith of the Titanic ordered the change in course based on four of the received messages.

" Three warnings were received from the crow's nest." (Myers 46) Even fifteen minutes before the Titanic struck, the lookout men had reported seeing an iceberg. No attention was paid to the warnings." (Myers 47) This was at 11: 15pm. Murdock, the officer in charge of the bridge, was accused of being tardy in answering the call from lookouts. That without his tardiness, the Titanic could have averted the disaster, allowing her to turn enough to hit the iceberg with her stern. (Myers 48) It was also noted that disaster could have been averted had the lookout men in the crow's nest been equipped with binoculars. They had requested these in Belfast, only to be turned away empty-handed.

The Titanic was 900 ft long, 25 stories high, and weighed 46, 000 tons. It was created with turn of the century design and technology. It possessed 16 major watertight compartments in the lower section of the boat. These were

easily sealed off if the hull was punctured. In the worse accident at sea (two ships collide) the Titanic should have been able to stay afloat for 2-3 days allowing time for resue. (Bassett) However, after the collision with the iceberg, the hull part of 6 of the 16 compartments were damaged. They sealed off the compartments but when the bow of the ship pitched forward from the water weight in that area, the water spilled over into the other adjacent compartments. They were only watertight horizontally, the tops were open and the walls extended only a few feet above the waterline." (Bassett) These compartments are what caused the general belief that the Titanic was ' practically unsinkable.' However it is found that without those compartments the water would have spread out, preventing the bow from weighing the ship down below water level. The White Star Line modified the Titanic sister ships, Olympic and Britannic, by extending the double bottoms up the sides of the hull, and the transverse bulkhead compartments were raised. (Garzke and others)

In addition to the design flaws, it was found that the hull steel and wrought iron rivets failed due to ' brittle fracture'. " This is a type of failure in structural materials that occurs without prior deformation and at extremely high speeds. Brittle fracture is caused by low temperatures, high impact load, and high sulphur content. At the night of the collision, all three causes were present." (Bassett) " Scientists recovered a piece of the hull steel and noted that the edges were jagged and sharp, shattered as if it was china. The metal showed no evidence of bending or deformation. High quality steel is more ductile and will deform rather than break." (Gannon, 1995) The steel recovered from the Titanic was given the " Charpy test" This is where a

cigarette sized coupon of steel from the wreck was held against steel backing and struck with a 67lb pendulum on a 2 ½ ft long arm. This was compared with modern steel and they were placed in a alcohol bath at -1°C to simulate the conditions of the disaster. The modern steel bent into a ‘ v’, wereas the Titanic steel “ pinged”, the pendulum barely slowed and the broken piece flew across the room (Bassett) The wrought iron rivets in the hull were also have shown to fail due to brittle facture. In addition to that design flaws, tests have ‘ shown that lesser quality iron rivets when they hit the iceberg, the weaker rivets in the bow popped, opening the seams in the hull” (Hooply-McCarty and Foeck)

From the beginning of the voyage, there were not enough lifeboats for the amount of people on the ship. “ If the lifeboats were filled to capacity, they would fit 1100 people”(Myers 17) “ The designer had allowed room on deck for 2 rows of lifeboats. One row was removed in order to make the deck ascetically pleasing.”(Bassett) “ The British Board of Trade regulations at that time stated that all British vessels over 10, 000 tons must carry 16 lifeboats with a capacity of 5, 500 cubic feet, plus enough rafts and floats for 75% of the lifeboats. These were obviously out of date as steamships had greatly grown in size proven by Titanic’s 46, 000 tons. Actually, The White Star Line had provided 20 lifeboats which was more than required by law, but inadequate for the amount of passengers on board. There were multiple changes in the laws and regulations after the Titanic disaster. “ After the Titanic sank, they strengthened the laws governing the use of radio equipment on ocean liners.” (Gale Group 1999) There were new established safety regulations. The US government also began ice patrols to alert the

English and US boats of approaching ice fields, they made sure the lifeboats were supplied properly, and change the requirements regarding lifeboats. Up to this point, lifeboats were based on tonnage, and this was change so that every person aboard the ship had a seat on the lifeboat. They also established lifeboat drills that were held once the ship sailed. (Visible Ink Press)

The Titanic barely made a noise when it struck the iceberg. Large amounts of the passengers had already gone to bed. “ Stewards and other members of crew were sent to arouse the people. Some refused to get up. The crew almost had to force the doors of the staterooms to make them appreciate their peril; many were drowned like rats in a trap.”(Myers 53) The slight lean the ship had as it was sinking, contributed to a larger loss of life, as few could believe that there was danger, and this resulted in the passengers going back to their various activities, or going to dress.

“ Once on the deck, many hesitated to enter the swinging life-boats. The glassy sea, the starlit sky, the absence, in the first few moments of intense excitement, gave them the feeling that there was only some slight mishap; that those who got on the boats would have a chilly half hour below and might, later, be laughed at. (Myers 57) The call was put out that the lifeboats would be filled with “ women and children first.” This caused a panic as many women clung to their husbands and refused to be separated. “ A number of steerage passengers were yelling, screaming and fighting to get on board. Officers drew guns and told them if they moved towards the boats they would be shot dead.” (Myers 59) However, once on the lifeboats, it was discovered that there was a ‘ lack of necessary equipment. The boats were

filled 1/3 to capacity, with no supplies, no way to raise sails or operate sailboats.” (Myers 72) Several of the lifeboats would return to allow some fo the survivors ot climb into the lifeboats, escaping from the freezing water.

The RMS Carpathia was the closest ship to the disaster that responded, and would be the one that brought the survivors to New York City. The total loss of life would amount to 1635 people. (Myers 17) From these survivors, a large portion of these are children from first and second class. Only 27 children were saved from the 79 total of third class passengers. This could also be contributed to the language barrier due to the large amount of foreign third class passengers. There were a total of 425 women aboard the ship, from first, second, third class, and crewmembers. Out of these, 316 survived. The majority loss of life, also coming from the third class passengers. Only 338 men survived the sinking, this is out of all 1352 men aboard. This is partially due to the ‘ women and children first’ rule.

At the time of voyage, there were a variety of the rich and powerful on the Titanic. These included: John Jacob Astor IV and his wife, Madelein, Macy’s owner Isidor Straus, and his wife, Ida, silent film actress, Dorothy Gibson, the Countess of Rothes, Denver millionaire, Margaret Brown, Sir Cosmo Duff Gordon, and his couturier wife, streetcar magnate, George Dunton Widner, Pennsylvania railroad executive John Borland Thayer and his 17yr old son, and U. S. presidential aide Major Archibald Butt. When news of the Titanic spread, the resulting panic insued because of some of the worlds’ movers and shakers were on that boat, and the public worried about how this would effect them.

The Titanic is one of the great sea disasters to date. The resulting loss of life and loss of large amounts of money, mail, and various riches that couldn’t be replaced, or retrieved. There are no survivors left of this disaster, however to this day, Belfast mourns the loss of 123 people from Lebanon traveling on the Titanic along with mostly European passengers and Asian crew. Every year they lay a wreath to commemorate the loss. (The Irish Times.)

The ultimate cause of the Titanic sinking was from striking an iceberg on its voyage from Belfast to its ultimate destination of New York. During the time they were crossing the North Atlantic, they were also battling a coal fire in one of the bunkers. It was assumed that the crew was attempting to break speed records at that time. However, the ship was built for comfort, rather than speed. And in further investigation of reports from surviving crew, the fire has become another factor as to why ship was moving so fast after reports came in about the ice fields in an area of the North Atlantic that made the travel distance shorter from the original planned route. “ If there was a reason for speed, it had to be something important, like a fire in a coal bunker that neede to be kept under control and put out as soon as the ship reached port.”(Science Daily)

The multitude of complications that arouse from this maiden voyage changed history from the large loss of life. This could have been avoided with simple precautions, and a more realistic idea of the ‘ unsinkable’ Titanic. The communication issue on the Titanic is what pioneered the wireless world today. The new regulations for ships at sea, resulted in more and better equipped lifeboats and ice patrols in areas known for ice fields. The designs and materials used for the ships were changed to allow for safer ships,

preventing the shattering of steel or water weighting down the ship. Without this disaster, would we have progressed this far so fast?