Causes and Effects of the Rapid Sinking of the Titanic

Abstract

On April 14, 1912, the R.M.S. Titanic collided with a massive iceberg and sank in less than three hours. At the time, more than 2200 passengers and crew were aboard the Titanic for her maiden voyage to the United States. Only 705 survived. According to the builders of the Titanic, even in the worst possible accident at sea, the ship should have stayed afloat for two to three days. This report discusses the material failures and design flaws that contributed to the rapid sinking of the Titanic. In addition, the report addresses the changes that have been made in both the design of ships and the safety regulations governing ships at sea as a result of the Titanic disaster.

Introduction

At the time of her construction, the Titanic was the largest ship ever built. She was nearly 900 feet long, stood 25 stories high, and weighed an incredible 46,000 tons [Division, 1997]. With turn-of-the-century design and technology, including sixteen major watertight compartments in her lower section that could easily be sealed off in the event of a punctured hull, the Titanic was deemed an unsinkable ship. According to her builders, even in the worst possible accident at sea, two ships colliding, the Titanic would stay afloat for two to three days, which would provide enough time for nearby ships to help [Gannon, 1995].

On April 14, 1912, however, the Titanic sideswiped a massive iceberg and sank in less than three hours. Damaging nearly 300 feet of the ship's hull, the collision allowed water to flood six of her sixteen major watertight compartments [Gannon, 1995]. She was on her maiden voyage to the United States, carrying more than 2200 passengers and crew, when she foundered. Only 705 of those aboard the Titanic ever reached their destination [Hill, 1996]. After what seemed like a minor collision with an iceberg, the largest ship ever built sank in a fraction of the time estimated for her worst possible accident at sea.

The purpose of this report is to explain the material failures and design flaws that contributed to the rapid sinking of the Titanic. Specifically, brittle fracture of the hull steel, failure of the rivets, and flaws in the watertight compartments will be analyzed. Human factors that contributed to the sinking will not be reviewed. In addition to the causes for the sinking, the effects of the disaster are reviewed. As a result of the Titanic disaster, changes were made in ship design, such as double hulls and taller bulkheads. Also, stricter standards for safety regulations governing ships at sea were implemented, including mandatory use of electronic communication, minimum lifeboat capacities, and the development of the ice patrol.

The first section of the report is a historical overview of the Titanic disaster. This section includes statistics on the Titanic and a time line of the disaster. The next section of the report is a discussion of the material failures and design flaws that contributed to the rapid sinking of the Titanic. In the last section, the design changes made to ships and the safety regulations that have been developed as a result of the Titanic disaster are explained. The report concludes with a review of the causes and effects of the rapid sinking of the Titanic. In addition, the conclusion provides a future perspective on the limitations of the shipbuilding industry.