

Private Submarine Passenger Contracts and Liability Investigation: Exploring The "Titan" Incident

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Abstract. The private submarine industry has witnessed significant growth, offering unique opportunities for exploration and adventure. However, it faces distinctive challenges in the realms of private submersible passenger contracts, liability, safety standards, and risk management. This paper explores these critical aspects and their relevance in the wake of the recent "Titan" incident, a sobering reminder of the pressing need for regulatory enhancements and safety measures within the industry. The study provides an in-depth analysis of private submersible passenger contracts, shedding light on existing legal regulations, their applicability, and limitations. It advocates for contract revisions that ensure clarity, protect passenger rights, and effectively allocate liability. Furthermore, the research underscores the paramount importance of stringent safety standards and comprehensive risk management practices in the private submarine sector. The "Titan" incident serves as a poignant backdrop, emphasizing the severe consequences of inadequacies in these areas. The paper calls for the establishment of industry-wide standards, improvements in accident investigation capabilities, and a refined approach to risk management encompassing risk assessment, early warning mechanisms, and efficient risk disposal plans. In essence, this study aims to contribute to a safer and more regulated private submarine industry, enabling responsible exploration while safeguarding passenger rights and well-being.

Keywords: Contract law, titanic submarine, passenger contracts, liability.

1. Introduction

Nowadays, individuals with substantial financial means frequently seek exclusive experiences that span from space traveling to deep-sea diving. This has sparked interest in private submarines among the affluent. Consequently, various companies have responded with luxurious private submarines designed to attract high-net-worth individuals for deep-sea diving adventures.

However, beneath the appeal of private submarines lies a complex legal framework. This paper centers on the domain of passenger contracts for private submarines, focusing on the "Titan" deep-sea submarine accident as a pivotal case study. Through an exploration passengers' rights and interests, the objective is to uncover legal deficiencies within contract terms and liabilities prevalent in the private submarine industry. The analysis aims to unveil potential instances of unreasonable or unfair clauses within these contracts, thereby contributing insights to enhance relevant laws and regulations while strengthening the protection of passengers' rights and interests.

To achieve this, the research approach entails several key components. The study will commence by scrutinizing the core elements of private submarine passenger contract. Subsequently, it will thoroughly examine the various entities responsible for the accident; analyze the contract laws and regulations in the private submarine industry. Additionally, the legal statutes governing contracts within the private submarine industry will be explored, accompanied by a comparative assessment of exemption clauses to gauge their legality and enforce ability. The analysis will extend to the study of clauses designed to safeguard passengers' rights and interests, dissecting both their protective mechanisms and potential limitations. Furthermore, the inquiry will encompass an evaluation of risk management measures and safety standards in the private submarine industry and assess whether they meet international standards and compliance requirements. Lastly, based on the findings, the paper will propose pragmatic regulatory measures aimed at cultivating the responsible growth and secure operation of the private submarine industry.

To accomplish these research objectives, a comprehensive array of research methodologies will be employed. Surveys, speculative analyses, comparative research, and analytical methods will collectively enable a thorough investigation of this intricate topic. Through these approaches, this paper intends to shed light on the legal intricacies and potential improvements in the contractual and operational landscape of the private submarine industry.

2. Analysis of Private Submarine Passenger Contract Content

2.1. Contract Formation Process and Elements Analysis

2.1.1 Contracting Parties and Procedures

Contract, in the simplest definition, is the foundation of legal promises, giving individuals the right to seek recourse if these promises are broken. These promises can involve commitments to perform specific actions or refrain from certain behaviors. Forming a contract relies on the mutual agreement of two or more parties, usually involving one party making an offer and another party accepting it. In cases where one of the parties fails to fulfill their commitment, the other party has the right to seek legal remedies. Contract law addresses fundamental questions, including the existence of a contract, its interpretation, breaches, and the compensation due to the injured party.

A contract represents an accord between involved parties, establishing mutual responsibilities that hold legal weight. As elucidated by Treitel in "The Law of Contract," a contract constitutes an agreement that triggers commitments upheld or acknowledged by legal authorities [1]. What sets contractual obligations apart from other legal duties is their foundation in the consensus of the contracting parties. Crucial components necessary for an arrangement to qualify as a legally binding contract encompass an offer, acceptance, consideration, certainty, intent to establish legal relations, and privity. Potential responses to breaches of a contract encompass general damages, consequential damages, reliance damages, and specific performance.

2.1.2 Contract Elements and Their Legal Effect

Contracts consist of six fundamental elements. An offer, for instance, represents a declaration of willingness to enter into a contract under specific terms, with the intent that it becomes legally binding upon acceptance by the intended recipient [2]. Conversely, an acceptance signifies an unequivocal and final agreement to the conditions outlined in the offer [3]. Consideration, a pivotal element, entails the exchange of value. This can manifest as rights, interests, profits, or benefits gained by one party, or as forbearance, detriment, loss, or undertakings undertaken by the other party, as exemplified in the Currie & Misa case [4]. Certainty entails that an agreement cannot be a binding contract if it lacks clarity, either due to excessive vagueness or conspicuous incompleteness [5]. The presence or absence of the intention to create legal relations determines whether a contract is legally binding. Priority concerns who can enforce or be bound by the terms of a contract.

In summary, contract law operates within a framework where not all promises can be enforced due to practical limitations, and one-sided promises typically do not result in significant losses if left unfulfilled.

2.2. Responsibility Allocation and Exemption Clauses

2.2.1 Responsibilities of Private Submarine Operators and Passenger Rights Protection

When examining the responsibilities of private submarine operators, one encounters the protective veil of waivers, shielding the operators from lawsuits arising due to the "experimental" nature of their crafts and the absence of "approved or certified by any regulatory agency." It expresses the inherent dangers associated with such ventures and serve as a stark reminder that perilous circumstances could lead to loss of life at any moment.

Regarding the protection of passenger rights, individuals intending to partake in a dive aboard the Titan submersible were required to execute a waiver document that prominently mentions the possibility of death on three occasions within its opening page. This release of liability agreement

explicitly enumerates various scenarios in which passengers on a Titanic expedition could face mortal danger, as per the document reviewed by Insider. These encompass exposure to "extreme pressure" or any submersible malfunction, encountering "unpredictable" conditions inherent to the oceanic or atmospheric environment, as well as risks associated with embarking on "small vessels and other equipment." Furthermore, the waiver delineates potential dangers linked to exposure to high-pressure gases, servicing with pure oxygen, and the operation of high-voltage electrical systems. By affixing their signature to this waiver, passengers not only acknowledge these potential perils but also effectively absolve the company of any subsequent responsibility or liability in the unfortunate event of such incidents.

2.2.2 Legitimacy and Limitations of Exemption Clauses

The waiver explicitly conveys the following: "I comprehend the inherent risks associated with the activities to be undertaken during the operation, and I now accept full responsibility for any potential risks involving property damage, injury, disability, or fatality." Furthermore, it includes the provision: "I hereby commit to defending, indemnifying, preserving, and absolving OceanGate Expeditions, Ltd. ... from any losses, liabilities, damages, or expenses they may accrue due to any claims filed in contravention of this Release [6]."

Exemption clauses serve several critical functions, including limiting the available damages to the parties involved, controlling the scope of contractual liability, and providing remedies to restrict breaches. However, it is essential to recognize the limitations of exemption clauses. By signing the waiver, passengers effectively waive their right to pursue legal action in the event of injury or any other loss. Nevertheless, it's worth noting that judges may choose to invalidate such waivers when there is evidence of undisclosed hazards or gross negligence.

In essence, the interplay between responsibility allocation and exemption clauses in the private submarine industry highlights the complexities and legal considerations involved in balancing the rights and protections of both operators and passengers.

2.3. Safety Regulations and Risk Management

2.3.1 Safety Provisions in Private Submarine Contracts

Navigating the depths of the ocean presents unique challenges, including the limitation of conventional communication methods. According to Jim Bellingham, a professor at Johns Hopkins and a pioneer in underwater robotics, radio waves struggle to penetrate the ocean's depths, either reflecting off its surface or being absorbed by the water. Submarines such as the Titan, however, adopt an alternative method, employing underwater acoustics for the transmission of data packets through the ocean. Onboard a support vessel, the receiving party can utilize a hydrophone to capture the acoustically transmitted data. Experts can subsequently convert this data into comprehensible information, such as text or audio.

Prior to embarking on a journey aboard an Ocean Gate submarine, passengers are presented with a contract that includes a stark warning. It explicitly states that the submarine has not received approval or certification from any regulatory body. Furthermore, it cautions passengers about the potential risks they may face, including physical injury, disability, motion trauma, or even loss of life.

2.3.2 Risk Management Measures and Safety Standards

In several interviews with various media outlets, including Seattle's ABC affiliate KOMO, Rush demonstrated the use of a PlayStation game controller for piloting the Titan submarine. One Harvard University professor specializing in marine biology expressed surprise at the misconception that controlling submarines is as straightforward and commonplace as using a video game controller. However, it's important to note that one of the researchers who has explored depths of 10,000 feet in a submersible believes that the game controller is unlikely to be the root cause of the Titan's issues compared to the physical construction of the vessel.

According to Bellingham, the most robust and lightweight underwater structure is a sphere, making the Titan's cylindrical shape the "second-best" option. Roterman, an expert in the field,

underscores the safety inherent in the spherical design, as water pressure applies evenly to its surface. To accommodate the submersible's large size, the Titan's designers utilized carbon fiber, the same material used for the submersible's body, which is sealed with two titanium caps, ensuring the vessel's neutral buoyancy, as explained by Bellingham. While the design and materials of the Titan are crucial factors, Bellingham emphasizes that the most critical aspect is the condition of the vessel and its pressure hull. The Titan's specifications claim that it is equipped with a system to actively monitor the hull's health. Nevertheless, submersibles like the Titan, with their repeated launches and recoveries onto an external platform, are susceptible to damage, potentially affecting their operational efficiency.

In a word, safety regulations and rigorous risk management in the private submarine industry are multifaceted and demand meticulous attention to both design and operational details to guarantee the safety of passengers and the integrity of these exceptional underwater explorations.

3. Liability Investigation of the "Titan" Incident

3.1. Incident Process and Responsible Parties

3.1.1 Overview of the "Titan" Deep-Sea Submarine Incident

After about 105 minutes of sailing, the Titanic submersible stopped communicating with its mothership. "Since Sunday, the Coast Guard has coordinated search efforts with the U.S. and Canadian Coast Guards, Air National Guard aircraft, and the USS Polar Prince (the mother ship of the Titan), covering an expanse of 7,600 square miles, an area larger than the state of Connecticut," Capt. Frederick said. It was also reported that a Canadian aircraft detected a "bang" noise every 30 minutes in the search area [7].

On June 28th, the exhaustive search for the wreckage of the Titan submersible and its passengers concluded. The chilling discovery of human remains on the seabed marked the grim end to the expedition. Eventually, the remains of the ship's wreckage were transported back to Canadian land. Observers witnessed segments of the Titan's wreckage being carefully loaded onto the Horizon Arctic ship, which then sailed to St. John's Harbor, Newfoundland. There, the wreckage was unloaded from the ship by a massive crane [8].

3.1.2 Involved Responsible Parties: Operators, Manufacturers, Passengers, etc.

Examining the operators behind the ill-fated expedition, it is essential to note that Ocean Gate, the operating company, may subcontract independent parties to offer various services during the expedition, including transportation. This arrangement implies that the expedition holds no control over or assumes any responsibility for the actions of these independent contractors. Consequently, the operator's stance is that they bear no responsibility, making it clear that they are not liable for any potential remedies.

For the passengers, they were required to sign a waiver before embarking on the Titanic expedition in a submersible, acknowledging that the Titanic is an "experimental ship" that has not been "approved or certified by any regulatory body and can result in physical injury, emotional trauma, or death." The document explicitly stated, "I hereby assume full responsibility for the risk of injury, disability, death and property damage resulting from the negligence of any Excluded Party during my participation in the Expedition. I hereby assume full responsibility for any and all risks of property damage, injury, disability, or death [9]."

Additionally, discussions centered around the design and material choices of the Titan submersible. Dr. Nicolai Rotterdam, a marine biology lecturer at the University of Portsmouth, highlighted that typically, the part of deep-sea submersibles housing humans is a titanium sphere around 2 meters in diameter. This choice of material is vital to withstand the immense pressures of the deep ocean. While carbon fiber is a strong and cost-effective alternative, it remains largely untested for deep-sea vessels like the Titan. Stockton Rush, OceanGate's chief executive, mentioned in an interview that while

carbon fiber is successfully used in yachts and aviation, it hasn't been employed in crewed submersibles.

Court documents further revealed concerns raised by Mr. Lochridge, who argued that the Titan's hull had not undergone rigorous testing under extreme pressures, potentially leading to issues. Troublingly, trials on a smaller-scale model of the submersible revealed flaws in the carbon material during pressure testing. Mr. Lochridge also highlighted concerns about the Titan's glass viewport, noting that the material's certification only extended to depths of up to 1,300 meters, casting doubts on its suitability for the submersible's intended mission in the abyssal depths.

3.2. Contract Breach and Liability Allocation

3.2.1 Analysis of Private Submarine-Contract Breach

Building upon our previous analysis of the "Titan" deep-sea submarine incident and the involved responsible parties, it is essential to delve into the potential breaches within private submarine contracts. These breaches extend beyond passengers and may also involve the operators and manufacturers of the submarines.

(1) Breach of Contract by Submarine Passengers

Firstly, passengers may violate safety regulations, such as carrying prohibited items or failing to adhere to the instructions provided by diving instructors. Secondly, they may fail to arrive at the stipulated time, place, or in accordance with the contract's requirements can disrupt not only the individual's experience but also affect the entire diving expedition. Thirdly, in cases where passengers deliberately damage the submarine equipment or associated facilities, they commit a breach of contract.

Contracts typically outline penalties for these passenger breaches, including measures like deducting part or all of the deposit, requiring passengers to cover equipment maintenance costs, or even contract cancellation.

(2) Breach of Contract by Submarine Operators and Manufacturers

Firstly, operators might breach the contract by failing to meet the safety and service quality commitments specified in the agreement. For example, if the equipment provided does not meet the standards outlined in the contract, it constitutes a breach. Besides, manufacturers can also breach the contract if they fail to deliver qualified submarine equipment in accordance with the contract's requirements.

The contractual provisions detail mechanisms for addressing breaches by submarine operators and manufacturers. Remedies such as compensation, equipment repair, or other relief measures are usually stipulated to ensure accountability.

When allocating liability for breaches, various factors come into play, including the nature of the breach, its consequences, and specific contractual terms. In different situations, responsibility may be determined by the court or an arbitration body, ensuring that those in breach are held accountable.

3.2.2 Legal Basis and Principles for Liability Allocation

The legal basis for the allocation of liability differs depending on the jurisdiction but shares common foundational principles. In the Anglo-American legal tradition, contract law finds its primary source in case law and statutory regulations. It revolves around the core concept of enforcing promises. Contracts are viewed as legally binding promises that can be upheld by the law. While civil law systems often refer to the "cause" as the basis of contracts, common law systems emphasize the concept of "consideration" as the critical element that renders a contract binding. Consideration involves one party providing a benefit or incurring a legal detriment, which can either be a legal advantage for the promisor or a legal disadvantage for the promisee. Valid consideration necessitates that it should occur between the contracting parties, be legally permissible, possess some form of value, and encompass a promise of future benefit.

The allocation of liability within private submarine contracts draws from general principles of contract law while also considering the unique characteristics and challenges of this specific domain. These principles are applied in a manner that addresses the distinct features of submarine contracts.

(1) Equality Principle

In private submarine contracts, the equality principle remains fundamental. Parties involved, including operators, manufacturers, and passengers, must be on equal footing when entering into agreements. However, the nature of these contracts involves distinct roles and responsibilities. Operators are responsible for ensuring the safety and proper functioning of the submarine, while passengers are typically expected to comply with safety regulations and follow instructions. Manufacturers play a pivotal role in providing reliable equipment. The equality principle must be applied in a way that respects these varied roles and responsibilities, ensuring that no party is unfairly burdened with undue liability.

(2) Voluntary Contract Principle

The voluntary nature of the contract is a crucial element in private submarine agreements. Passengers voluntarily choose to embark on these expeditions, recognizing the inherent risks involved. Operators and manufacturers voluntarily provide their services. While the principle of voluntariness remains intact, it should be understood in the context of passengers willingly accepting certain risks, acknowledging that they have signed waivers, and operators and manufacturers providing their services without coercion.

(3) Fairness Principle

The fairness principle becomes especially pertinent in the context of private submarine contracts due to the potential for extreme risks and unforeseen circumstances. Fairness entails that contractual terms and conditions are reasonable and just, especially in light of the unique and challenging conditions that can be encountered during deep-sea dives. These principles mandate that contracts are structured to protect the interests of all parties involved, taking into account the extreme environment and the associated risks.

(4) Good Faith Principle

The good faith principle is critical for the safe and effective operation of private submarines. It is an obligation for all parties involved to act honestly and fairly in both the performance and enforcement of contracts. Operators must maintain and operate submarines in good faith, ensuring the safety of passengers. Passengers must participate in the expedition in good faith, adhering to safety protocols. Manufacturers must provide reliable equipment in good faith. Any breach of good faith can result in adverse consequences in such a high-risk environment.

The unique characteristics of private submarine contracts demand that these principles are applied while considering the extraordinary challenges and potential hazards inherent to underwater exploration. The allocation of liability must strike a balance between providing passengers with a safe and enjoyable experience and ensuring that operators and manufacturers are not unfairly burdened with liability for unforeseeable events or actions of passengers. These principles, when applied judiciously, help in achieving a fair and equitable allocation of liability in this distinctive contractual domain.

3.3. Legal Litigation and Dispute Resolution Mechanism

3.3.1 Possibility and Limitations of Legal Litigation

The resolution of private submarine accidents poses unique challenges, demanding an examination of the possibilities and limitations of traditional legal litigation, as well as exploring alternative dispute resolution mechanisms specific to this industry.

Legal litigation, while a conventional means of dispute resolution, encounters distinctive limitations within the context of private submarine accidents. Firstly, submarine accidents often occur

in international waters or within areas subject to ambiguous jurisdiction. This raises complex questions about which legal framework should apply, potentially leading to lengthy disputes over jurisdiction, delaying justice and affecting the efficacy of litigation. Secondly, collecting evidence from the depths of the ocean can be immensely challenging, potentially resulting in incomplete information or conflicting accounts of what transpired during an accident. Expertise in underwater exploration, technology, and the specific operations of private submarines is essential to properly evaluate cases, which may not always be readily available. Lastly, legal litigation can be expensive and protracted. Pursuing claims in the case of private submarine accidents may involve significant expenses for both plaintiffs and defendants, often extending over extended periods. This can be a barrier to justice for many involved.

3.3.2 Third-Party Mediation Mechanism in the Private Submarine Industry

Given the limitations of legal litigation in private submarine accidents, the industry has increasingly explored alternative dispute resolution mechanisms. Third-party mediation emerges as a promising avenue.

Mediators with expertise in submarine operations and underwater exploration can facilitate informed discussions, ensuring a nuanced understanding of the circumstances surrounding an accident. This specialized knowledge can contribute to fair and efficient resolutions. Moreover, mediation typically offers a more expedient and cost-effective route for dispute resolution compared to lengthy legal proceedings. In the context of private submarine accidents, where time and costs are critical, mediation provides a valuable alternative. Additionally, mediation allows for more flexible and tailored solutions. The parties involved can work together to develop creative remedies that address the specific needs and concerns arising from submarine accidents.

4. Regulatory Recommendations and Improvement Measures

4.1. Enhancing Private Submarine Contract Regulations

4.1.1 Improving Legal Provisions in Private Submarine Passenger Contracts

At present, domestic and foreign laws and regulations on private submersibles are not perfect. In many cases, the owner and operator of the submersible may not have entered into a formal contract with the passenger, resulting in many disputes between the two parties regarding the determination of liability and compensation in the event of an accident. Therefore, improving the legal provisions for private submersible passenger contracts is a top priority. To address this, the introduction of mandatory written contracts is vital. These contracts should outline the principles and requirements for contract formation, ensuring transparency and legal protection for both parties. Furthermore, rights and obligations of all parties should be clearly defined, including the division of responsibilities among submersible owners, operators, and passengers. This would also involve specifying post-accident procedures and responsibilities. Stricter penalties for violations and increased financial repercussions for breaches should be in place to deter contractual violations.

4.1.2 Strengthening Passenger Rights Protection Clauses

Another aspect that requires attention is strengthening passenger rights protection clauses in contracts. These clauses are essential for safeguarding the legitimate rights and interests of passengers. They should encompass various elements, such as the scope of liability, defining the responsibilities of submersible owners and operators in the event of accidents, as well as the extent of risk passengers should bear. Clear compensation standards post-accident should be stipulated, covering aspects like bodily injury, property damage, and moral distress. Importantly, it should be mandatory for submersible owners and operators to purchase relevant insurance for passengers. This ensures passengers receive adequate insurance protection in the event of an accident.

4.2. Optimization of Safety Standards and Risk Management

4.2.1 Establishing Comprehensive and Strict Submarine Safety Standards

In the pursuit of enhanced safety in the private submarine industry, there is a critical need to focus on safety standards and risk management strategies.

First of all, improve submersible safety standards: formulate comprehensive submersible safety standards and specifications, and strictly require the design, manufacture, operation and maintenance of submersibles to ensure that their safety performance meets the standards. To further bolster safety measures, it is essential to strengthen equipment troubleshooting mechanisms. Submersibles are intricate machines with many components. Having a system in place that enables prompt repairs and replacements when issues arise is paramount. This ensures that submersibles remain in optimal working condition, mitigating potential risks. Moreover, there is a critical need for enhanced safety training for submersible operators. This training should focus on equipping operators with the skills and knowledge necessary to respond effectively to emergencies. By improving their ability to handle unexpected situations, the probability of accidents can be fundamentally reduced.

4.2.2 Enhancing Risk Management Requirements and Safety Measures

There is a need to establish a robust authorization system for submersibles. This system will ensure that only individuals and institutions possessing the requisite qualifications and capabilities can own and operate these vessels. By doing so, the industry can substantially enhance safety by entrusting submersibles to those with the expertise to manage them effectively.

Furthermore, it is imperative to promote the widespread adoption of diving recorders. These devices enable real-time monitoring and data recording of the diving process, leading to improved accuracy in accident investigations and responsibility attribution. Their utilization enhances overall safety by providing valuable insights and evidence.

What's more, a risk management optimization strategy is essential. This strategy begins with risk assessment. It involves evaluating potential risks thoroughly, enabling targeted preventive measures to enhance safety. Complementing this is the establishment of a risk early warning system. It acts proactively, detecting and predicting risks promptly to ensure timely intervention. Finally, there's the need for a well-defined risk disposal plan. This plan outlines procedures for effective emergency response, minimizing harm during accidents.

5. Conclusion

The private submarine industry presents a unique set of challenges and risks, necessitating comprehensive regulatory and safety improvements. The recent "Titan" incident serves as a stark reminder of the need for stringent contract regulations, robust safety standards, and effective risk management measures.

Our study on private submersible passenger contracts and liability aimed to address several critical aspects. Firstly, it underlines the urgency of refining legal regulations governing the industry. Contracts should not be mere formalities but essential documents that clearly define rights, obligations, and liabilities for all parties involved. This study also emphasizes the importance of industry standards. The private submarine sector must establish and adhere to robust safety protocols. It's evident that while submersibles enable extraordinary adventures, they also expose passengers to unique dangers, and industry standards are paramount in mitigating these risks. Additionally, our examination of this field sought to enhance accident investigation and handling capabilities. The "Titan" incident demonstrated the essential role of accurate investigations in determining liability and responsibilities when accidents occur. Lastly, our study calls for a more refined approach to risk management. The unpredictability of submersible expeditions necessitates the development of comprehensive risk assessment, early warning systems, and disposal plans.

In summary, the "Titan" incident serves as a harsh reminder of the perils and promises of the private submarine industry. Our study aims to chart a course towards a safer, more regulated, and

responsible industry. It's our hope that this research will encourage both industry stakeholders and regulators to come together in reshaping the private submarine industry, ensuring the safety and well-being of all who partake in its adventures.

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