International Journal of Recent Advances in Multidisciplinary Topics
Volume 3, Issue 4, April 2022
https://www.ijramt.com | ISSN (Online): 2582-7839


# Theoretical Concept of Cost-Efficient Zeppelins Blimp with Carbon Dioxide Mixture used as Inflation Material with Compressive Storage

K. R. Gokula Krishnan*
*Department of Aerospace Engineering, Hindustan Institute of Technology and Science, Chennai, India*

***Abstract*: Zeppelins and Blimps are the primitive form of air planes which we used for transatlantic transportation till the Hindenburg [1] incident; the reason for the Hindenburg incident is usage of highly flammable hydrogen as inflation material instead of helium which is difficult to extract from atmosphere and expensive till date, so many companies abandoned the helium based Zeppelins and blimps and switched to Hydrogen based which is cheap and abundant which caused the tragic incident .and for the future sustainable green aviation Zeppelins can be a good alternative to jet planes and here I have explained in detailed, how to make it as cost efficient and sustainable and thriving market.**

***Keywords*: Zeppelins, helium, carbon dioxide, compressive storage, zero carbon aviation.**

## 1. Introduction

Helium can be liquefied into liquid helium when the pressure drops below the atmospheric pressure and Carbon Dioxide forms dry ice and that sublimates into Carbon Dioxide and the cycle continues which makes storing and reuse the inflation material more than one cycle and instead of releasing it into the atmosphere. The reason why the Helium is expensive because it can be extracted only via few methods like Coconut charcoal Method [2] and Dewar's Flask method, both are not commercially viable and cannot mass produce to avail cheap

## 2. Methodology

We use Carbon Dioxide Sublimation to increase the mass in the inflation causing the Zeppelin to land and increases the pressure enough to start the compressor to liquefy the helium causing liquid helium to store in the storage and the carbon dioxide to solidify, and since helium stored in liquid and carbon dioxide as solid dry ice and helium is inert in nature and Dry ice is solid and cold enough to store helium.

## 3. Design and Working Principle

From fig. 1, it has clearly shown it has additional deck and additional lining and valve system compare to traditional Zeppelin, because since the carbon dioxide stored as dry ice and it doesn't require special storage tanks and meanwhile the helium needed a separate tank to store and controlled release and pressurization of Helium and the separate lining inside the Zeppelin increases helium surface area and helps us to easily control the Helium usage.

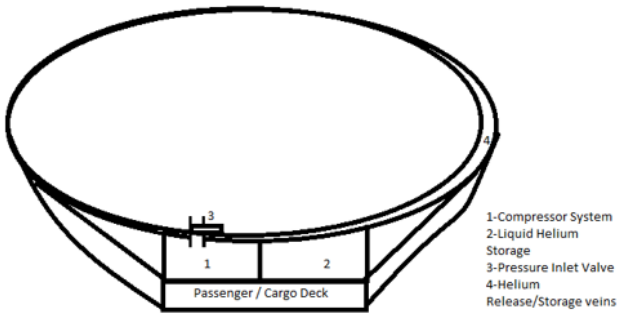


Fig. 1. Rudimentary diagram of the zeppelin system

### *A. Theory*

Helium has the special property other than inert and less dense and lighter gas, which is, it can be liquefied when pressure less than atmospheric [3] which makes perfect suitor for the inflation material, and liquid helium also has another property which is it can condense other gaseous element present in the same chamber [4], which helps us to solidify the dry ice and also helps to land the Zeppelin since the dry ice is denser and has weight [5] more than the carbon dioxide.

### *B. Working Principle*

To take off from the ground the helium valve is released , causing existing Carbon Dioxide Solidify and forming Dry Ice and causing Zeppelin to launch from the ground and to maintain the lift the helium pressure needed to be maintain and to land , just power up the compressor which causes pressurization and liquefy the helium and flow through the inner lining and since the lack of cooling the dry ice sublimates and fills the Zeppelin which makes the Zeppelin landing gradually, Unlike Hindenburg [1] even this crashes it can assure the passenger safety . Since it has a Carbon dioxide storage inside it prevents fire hazards and doesn't cause fire in the event of crash.

## 4. Calculations

As per the calculations, for maximum efficiency the Zeppelin can operate at 40% Dry Ice and 60% Helium for lesser altitudes

*Corresponding author: gokulakrishnan.work.sub@gmail.com

and 75% Helium an 25% of Dry Ice for higher altitudes, Since the Dry ice/Carbon Dioxide is denser than the helium, it needed to be lesser than helium.

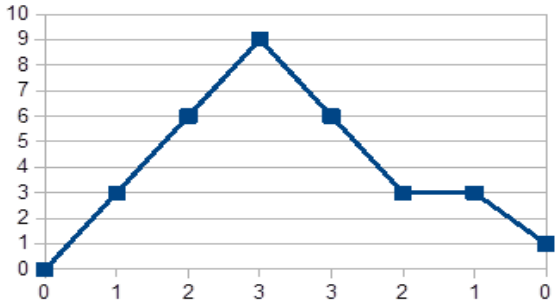


Fig. 2. The efficiency of the helium carbon dioxide blend

## 5. Conclusion

For the better , safe and clean aviation future, Zeppelin paves a path for it and it is no denial that to make Zeppelin safer than the existing system , This is a viable solution compared to the existing hydrogen and helium solutions and according to this method for peak performance the dry ice can be used from 25-40% of mass and 60-75% Helium respectively For a perfect Take-off and Landing and Since Helium temperature (-268ºc) is less than the Freezing point of Dry Ice (-74ºc) ,Helium can maintain the Carbon Dioxide as Solid and after the absence of Helium Dry Ice sublimes to Carbon Dioxide gas and helps us on landing.

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