Comparative study of Ancient Indian Vimanas and Modern spacecraft conceptual approach

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Abstract : From Ancient time man in the world is considering velocity study and firstly invented Wheel, produced bull-cart and vehicles whoever velocity is increased by different sources. We are moving with a today velocity of noise with the aid of rocket or jet. But nonetheless our company is not pleased with this velocity. To maneuver by having a velocity of light without fuel is end dream of real human on planet. This dream promising option is to to complete fill raise the velocity of present vehicles by Study of aircrafts used by gods rakshas etc. Rukma vimana is just one of the vimanas mentioned within the book vimanikashasthra which is an early on century that is twentieth sanskrit text on aeronautics. This comparison study between ancient vimanas and modern spacecraft enhances our knowledge towards vedic culture which was in India so many years back and in which there is the mention of aircrafts, which has same structure as modern aeronautical vehicles. To prove the validation of vymanika shastra and the aero structures mentioned in the journal.

IndexTerms **– Aerodynamics, , Ancient aerospace , Indian vimnas , Vedic science.**

I. INTRODUCTION

Science has played a very important role from ancient days suach as rukma vimana is one of the vimanas from vyamanika shastra which has same structure and even same capacity of carrying passengers is almost same. When Maharshi Bhardwaj's vymanika shastra was written in journal form by Pandit sastry then it was criticised that the structure of rukma vimana can't fly, but NASA has proved this criticism wrong. Even the usage of mercury as fuel in aircrafts is possible, NASA has created mercury vortex engine and in vymanika shastra there is a mention of padma rasam which is the Sanskrit name of mercury. Mercury with the help of electric propulsion or by applying magnetic field can be used as fuel due to its density.In vymanika shastra there is the mention of ancient aircraft which were used during Mahabharata and before. It also states about thr different types of aircraft and their specific functionality. Even though we don't use these specific aircraft as they were described in these books we can find their influence on the present-day aircraft. But still, we couldn't say all of this work was our own as we too had referred to some of the works of European nations. But using these materials or methods to build an aircraft would be a lot difficult as some of the alloys that were mentioned in their usage are not found or extinct even the structures like we have mentioned above. And we are not sure even if we have those materials we would get a desired product that gives us speed and a desirable lift but we can co relate it to some extend. Even though some of these models are aerodynamically proven to be accurate and also has given successful out come in present scenario. In this we have done comparison between the structures on the basis of their –

1 . Structures
2. Dimensions
3. Capacity

Figure1 : Comparison Between Rukma Vimana and NASA's Dragon Space Craft

From figure1 we can see the similarity between the structures and most iconic thing is they both are from totally different period. The behind the Drago must be from the Vedas we can atleast evaluate that the structure from ancient time atleast has the capacity to fly , it follow the laws of Newton even aerodynamically fit to fly also.[1]

II . RUKMA VIMANA

Rukma vimana comes under Kritaka vimana which was one of the classes of vimanas according to ancient indian sciences.It was constructed using material with high strength properties and also that has light weight properties. According to Vymanika shastra rukma vimana topped a speed of 725 miles per hour. Rukma vimana has a main body whose geometrical shape looks like a cylindrical cone. To suck air from the top, rukma vimina had 4 long and vertical ducts with fans, this air is sent down which utilizes electrical energy through sun crystal located at the top of vimana derived from sun converts it into electro-mechanical energy which enables rukma vimana to lift off in this process. It also had fan pipes, mica pillars and electromagnets within the body to enable it to fly. In ancient times, Raja loha is used in the manufacturing process of rukma vimana which is made by combining various metals and herbs that were available eco-friendly at those times. This alloy played a major role in protecting the body from heat flux and high temperature radiations. We can prepare perfect rajaloha by combining all the components of mixture experimentally in exact required proportions and it can be used for modern space vehicles. Rajaloha's properties are similar to that of NASA's space shuttle heat shield tiles. [2]

Rukma vimana mainly consists of :

Main body - All the floors in vimana are 20 feet high with the bottom floor consisting wings, electromagnets and landing gear. The remaining floors were used as cabins for people and pilots. **Propeller** - there were 8 propellers in total in which the lift propellers, which were on top of the vimana generating lift,and the ones attached to the bottom floor, the side propellers are for VTOL(vertical Take-Off and Landing and for directional control.

Pillars - 8 mica pillars were used to uphold the structure

Electromagnets - Total of 8 pairs of electromagnets with an offset of 45 degrees are arranged in the ground floor of the vimana.

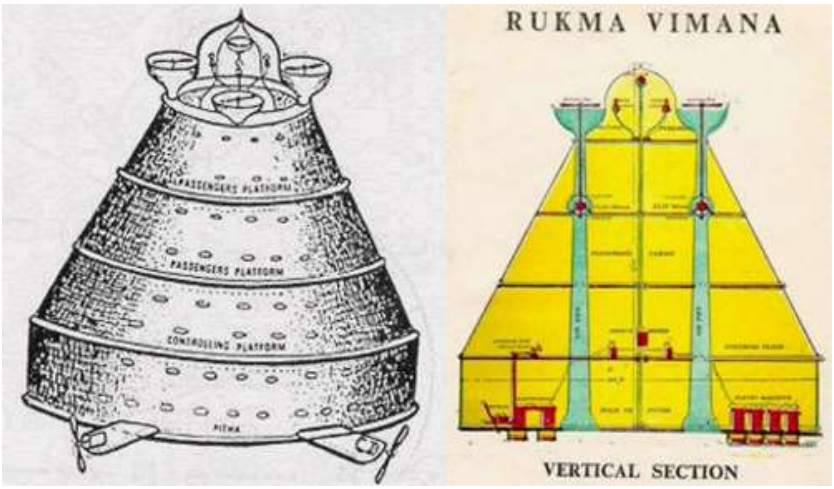
Metals used - The metal raja loha used in making rukmavimana is consider to be one of the strongest metals according to ancient science it is made up of the following components.

1. Ammonium chloride: NH_4Cl
2. Benzoin $C_{14}H_{12}O_2$
3. Lead
4. Lodhra plant - used to prevent radiation
5. Sea-foam : Derived from offshore and algae.
6. Iron pyrites
7. Mercury
8. Iron
9. Natron ($NaHCO_3$)
10. Saltpetre KNO_3
11. Borax $Na_2B_4O_7\ 10H_2O$
12. Mica
13. Aconite:$C_{34}H_{47}O_{11}$
14. Silver

The golden color of rajaloha was from using curd, milk, ghee, sugar and honey.

Though using most of the elements while constructing a vimana doesn't make practical sense, we can see usage of some of these ingredients in present day space craft or aircrafts like usage of mica reduces heat flux thus preserving the temperature inside the aircraft.Scientific studies and analysis shows us that the design of rukma vimana is considered to be viable not so in space crafts, some of the latest drone designs similar to that of rukma vimana though not an exact copy but we can see traces of inspiration from the actual design.[3]

Figure2 : Rukma Vimana



From figure2 we can see the structural dome shape of rukma vimana and it's three layer which has the capacity of carrying 3 passengers. The aerodynamic structure is fit to fly. If the thrusters are provided in the right position it can take the flight. . RUKMA VIMANA had ducts which can be long vertical
followers on the top to draw environment from the which is top deliver it down the ducts, creating a lift
when you look at the procedure.Utilization of electrical energy to use Electro-Mechanical arrangement
allow vimana to lift off and speed up control that is directional through mainstream rudder system
provided at the base and articulated through crescent plate that is shaped in the form of push pull rods.
Rukma is stated to achieve speed up to 250 miles in 24 minutes, a speed of 725 kilometers per Hour.
The looks is had by the Rukma vimana of the gorgeous hovercraft, being fantastic in color; it uses energy that is solar. Propulsion energy systems derive energy from engine-driven propellers,internal-combustion, jet propulsion, mercury and energy that is solar.

III . NASA'S DRAGON SPACECRAFT

The Dragon spacecraft was supposedly the first commercial reusable spacecraft made by SpaceX. It was launched into orbit by a Falcon-9 launch vehicle. The Falcon-9 which was going to launch the eDragon was using LOX/RP-1 engines using nine of them in stage one and one in stage two. Dragon was designed not solely to deliver cargo to the International Space Station but also to bring back cargo and experimental samples back to the ground. Dragon is the first one of this kind. The next version Dragon-2 is capable of sending not just cargo but humans as well.[4]

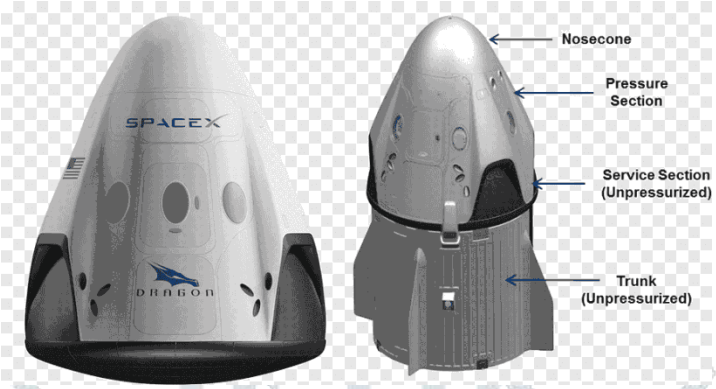
Dragon's specification

HEIGHT	8.1m/26.7ft
DIAMETER	4m/13ft
CAPSULE VOLUME	9.3m^3/328ft^3
TRUNK VOLUME	37m^3/1300ft^3
LAUNCH PAYLOAD MASS	6000kg/13228lb
RETURN PAYLOAD MASS	3000kg/6614lb

Dragon's trunk not only contains unpressurized cargo but also supports spacecraft during ascent where half of it is covered in solar panels which powers the Dragon while on station and in flight as well. Trunk stays attached to Dragon right until the re-entry. Trunk has a volume of 37 cubic meter.
Dragon's capsule which is the pressurized section allowing the transport of people and environment sensitive cargo.Dragon has draco thrusters which is one of the two engines developed by SpaceX and it is a hypergolic liquid rocket engine that allows it to maneuver while still in orbit. It has a special in- built emergency escape system, the launch abort system.[4]

It ensures the crew safety by ejecting the launch abort system far away from Falcon-9 with the help of 8 super draco engines which would propel the spacecraft far from the rocket. Escape thrust generated by these super draco thrusters is 71kN. These thrusters can propel the Dragon away from the launch vehicle half a mile away within 8 seconds.It also has16 draco thrusters helping in orbit adjustment, apogee and perigee maneuvers and attitude control.
These thrusters are capable of generating a 400N force each.
During reentry Dragon deploys two drogue parachutes for stabilizing the spacecraft and deploys four main parachutes to increase the drag thus decelerating the spacecraft. [4]

Figure3 : NASA'S Dragon Spacecraft



From figure3 we can see that spacecraft is divided into 4 sub parts which are Nosecone, Pressure section , Service Section , Trunk. Thos capsule also has a section which help in the transportation of the passengers of people as well as it can also be used as the cargo carrier. It also has 8 thrusters which help in escaping it from the orbit. Till now 25 launch vehicles are successfully launched.

CONCLUSION

We can conclude that the criticism which was done in vymanika shastra was no explanation of how the aeroplanes fly in air, mention of bizarre or absurd ingredients to build devises and the designs of aircrafts are non – aerodynamic are proved false specially for the point that these aircrafts are non aerodynamic structures. As NASA's dragon spacecraft has same aerodynamic structure as rukma vimana. The space craft is a successful space vehicle which has capacity of carrying 7 passengers where as in rukma vimana the capacity of carrying people was 3. So this criticism is proved false even from the Vyamanika shastra . Even the usage of mercury as a fuel is also questioned , hence by the use of applying magnetic field or by plasma method it can be used is proved.

Gravitational Force is among the first significant properties essential for effective flight. To overcome this difficulty among the promising choices would be to study residential property that is gravitational regulations by considering air as a fluid method. Just by using Newton's three guidelines of movement and Archimedes & Bernoulli's Principal, you are able to overcome this difficulty. One other way by just idea that is straightforward whenever a body rotates about an axis by having a greater than particular Velocity, weight of the actual body decreases, it's going to be becomes weight less at specific velocity.
God like kinnaras, Gandharvas among others like Ravana have livingly traveled through environment with special aircraft.It is made out of material which has extremely high energy but weight property this is certainly negligibly tiny material. This particular product are fabricated by using nano- techniques.
A book titled "Brihad Vimana Shastra" by Shri Bramhamuni Parivrajaka contains verses in Sanskrit (explaining aircraft) using their Hindi translation. Book entitled "Vymanika Shastra" by Shri G.R. Josyer has appeared containing similar Sanskrit passages using their English translation. Our Main issue in this report shall be with one of several vimanas mentioned in vimanikashasthra- Rukma Vimana.

In this we can see the comparison which is valid upto some extends NASA has even follow the structure from the vedic literature manufacturing and capacity is even same . If we talk about drago the spacecraft equipped with 16 thrusters which are used during mission. It has another part which is trunk which is covered with solar panels which is helpful for energy.

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