**Defending the First Claim:**

"The ratio of the distance between the second vane ends of two consecutive vanes and the distance between the second blade ends of two consecutive blades of the rotor is given by a factor A which can assume values from 2.6 on"

Higher Ratio A = a / b means that ether the Numerator bigger or the Denominator smaller. Smaller denominator means that we have higher number of blades. In Greet Turbine, we have the higher ratio A1. In Giorgini turbine, we have the second largest ratio A2, and Robert turbine has the least value A3. We can see that the number of blades is the biggest in the Greet turbine. We can compare the number of blades: in Greets N1 = 16, in Giorgini’s N2 = 4, in Roberts N3 = 3.

The other aspect of ratio A is the amount of air that can two consequent directors pass, higher A means we have higher intake for a number of blades. For our case, we have higher intake of air in Geert turbine a1 then in Giorgini a2 then in Roberts’s a3.

So now, we need to look to the positives of higher number of blades N and the higher intake of air.

Higher number of blades means we have higher area faces the inlet air then we have higher spin and higher moment of rotation which have already proven in the first report and in it we found that Geert turbine have the higher Moment of rotation.

Higher intake of air means we have a huge amount of air will be delivered to the blades. Their air another idea of higher inlet that we will have a huge air compression at the end of two consequent directors, but this depend on its outlet area. So let’s check the outlet area a2 for the three turbines: For Geert Turbine’s a2 = 0.46687, for Giorgini’s a2 = 0.81034, and for Robert’s a2 = 0.57703. higher Ratio inlet to outlet usually gives the highest compression ratio. So we can calculate Numerically using CFD software the ratio of Compressed air, and higher ratio means we have the best installed directors (w/o looking on the streamlinearty which is the best in Geert Turbine, where the flow faced the blades tangently not attacking.

Using Ansys Fluent CFD software, we have the flowing rounded results, for a flow have a velocity of 5 m/s.

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Geert** | **Giorgini** | **Robert** |
| **V1** | 5 | 5 | 5 |
| **V2** | 35 | 22 | 9 |
| **Compression Ratio: V2/V1** | 7 | 4.4 | 1.8 |

From the table and what all mentioned earlier, we can said that the ratio A of Geert turbines gives the best efficiency.

**Defending the First Claim:**

"The cavity is cylindrical with a diameter, the diameter of the rotor being approximately 2.875 multiplied by the diameter of the cavity"

Let us form a table of studied dimensions for the three turbines:

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Geert** | **Giorgini** | **Robert** |
| **Dia. Of Cavity** | 0.4491 | 0.25 | 0.374 |
| **Ratio of multiplication** | 2.875 | 4.56 | 3.07 |
| **Type of Cavity** | Opened | Closed | Opened |

Higher blades diameter means higher spin and moment of rotation, and bigger cavity diameter have two meanings, the first we have less inertia of rotation, which makes the blades lighter and more spin, and the second that the pressure on each blade will reduced for turbines have low number of blades. For turbines with high number of blades this not important because we have more blades.

Here we can’t directly judge the performance from these parameters because they have opposing in performance in each turbine, for example in Geert turbine’s we have the highest cavity diameter which means less inertia of rotation, and more spin and moment of rotation, but it’s have the least outer diameter. In the other turbines we have the same issue and form numbers, we can’t give a judge. However, all the enhancement that these parameters give goes toward increasing the spin and moment of rotation and reducing the inertia. In the first report, we had proved that Geert gives the best moment of rotation.