Demo test plan

PROPULSION SYSTEM SIMULATION

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1. Aim & Hypothesis

1.1. Aim

The aim of this test is to let the client use the simulation interface to calculate different aspects of the propulsion system.

1.2. Hypothesis

If we build an user-friendly interface, the client can use this simulation to design a more efficient propulsion system.

2. Variables

After the goals of the test have been determined, we define the variables that we'll adjust to reach the goals.

Limit	Keep constant at...
Ambient temperature	Standard indoor temperature with lower and upper limits (20 °C ± 5°C).
Battery level computer	Constant power source.
Software Excel	Newest version.
All input variables	Real positive numbers & ISO-notation.

Property	Vary and/or measure
Power input variables	
Motor input rotation speed	Vary
Motor input torque	Vary
Power transmission variables	
Shaft material	Vary
Shaft size	Vary
Shaft shape	Vary
Shaft contact friction	Vary
Gear material	Vary
Gear size	Vary
Gear shape	Vary
Gear contact friction	Vary
Bearing material	Vary
Bearing size	Vary
Bearing shape	Vary
Bearing contact friction	Vary
Power output variables	
Propeller material	Vary
Propeller size	Vary
Propeller shape	Vary
Propeller surface smoothness degree (contact friction with water)	Vary
Propeller rotation speed	Vary
Propeller torque	Vary

3. Tools

We divide the tools into two types. The first one is "testing tools" which are the tools requires to perform the test. The second one is "measuring tools", which are the tools required to measure the given limits and properties.

Testing tools	Demand
Computer	Windows 10 compatible
Excel	Newest version.
Keyboard	No limit.
Mouse	No limit.

4. Method

This section consists of actions that need to be performed during the test in order to conclude a result. The conditions of the limits stated in chapter: "2. Variables" have to be met before executing the simulation. To execute the simulation, follow the steps stated below.

1. Power up laptop and open Excel.
2. Load in the: "Propulsion system simulation" file in Excel.
3. Type in current values to simulate the present propulsion system.
4. Modify the value of the desired properties.
5. Perform a simulation for every property value modification
6. Compare the results of simulations before and after the modification to figure out their effects on propulsion system.
7. Keep the values which improves the propulsion system.
8. Print improved values.
9. Save changes to new file.
10. Close Excel.
11.

5. Expected results

This section checks whether our design passes the test or not, by stating the expected results.
This demo will have a couple of outcomes:

- The expected result is the first situation, where the client is happy with the simulation and can use this for all his intended uses.
- Secondly, the client could be not satisfied with the simulation and cannot use it how he intends to.
- Lastly, the client could be somewhat satisfied with the simulation but his usage is limited.

If the outcome of this test does not equal the stated expected result, the test is considered as failed. When the user's input variables do not meet the stated limits, the program should notify the user.