Developing an Automated System that logs Control Inputs real-time during Operation of a Whirl Tower Test Rig

Project Outline

The MERIT test rig is a whirl tower featuring an 85kW motor and constant-rpm control, capable of monitoring rotor blade behaviour in a variety of extreme flight conditions, most notably deep dynamic stall in a two-blade configuration. While the sensory data all has a well established data acquisition system which stores data for post processing, all of the input controls are currently logged manually with pen and paper.

In order to reliably log and store these values, first a reliable connection would need to be established between the PC and the control panels, which are currently isolated systems (though dedicated software can be implemented for this). Then the existing DAQ software (LabVIEW) would need to pair with this to access this data in real time, and store it appropriately and synchronised.

Project Plan and Milestones

- Familiarisation with the Test Rig hardware and software, and literature review on potential other options.
    - **MS1: Conclude theoretical process chain to establish connection**
- Establishing the connection between the systems using dedicated software.
    - **MS2: Access and store values via any methods**
- Establishing link between DAQ software and dedicated software to ensure synchronisation
    - **MS3: Measure and store synchronised data via existing DAQ software.**
- Conclusions
    - **Final Report**

Prerequisites:

Basic understanding of DAQ and sensory equipment
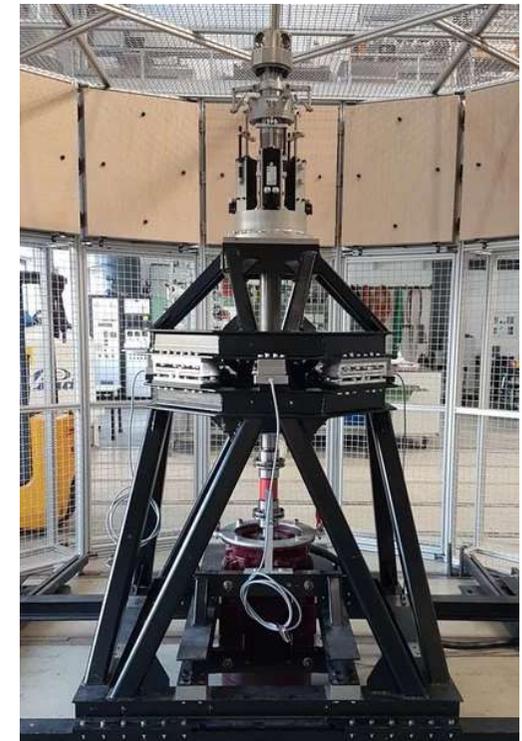Systematic Approach to Problem Identification and Solving

Fig 1: The MERIT Test rig, without blades attached

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