

# Universal Helicopter Transmission Test Cell

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## Problem Statement

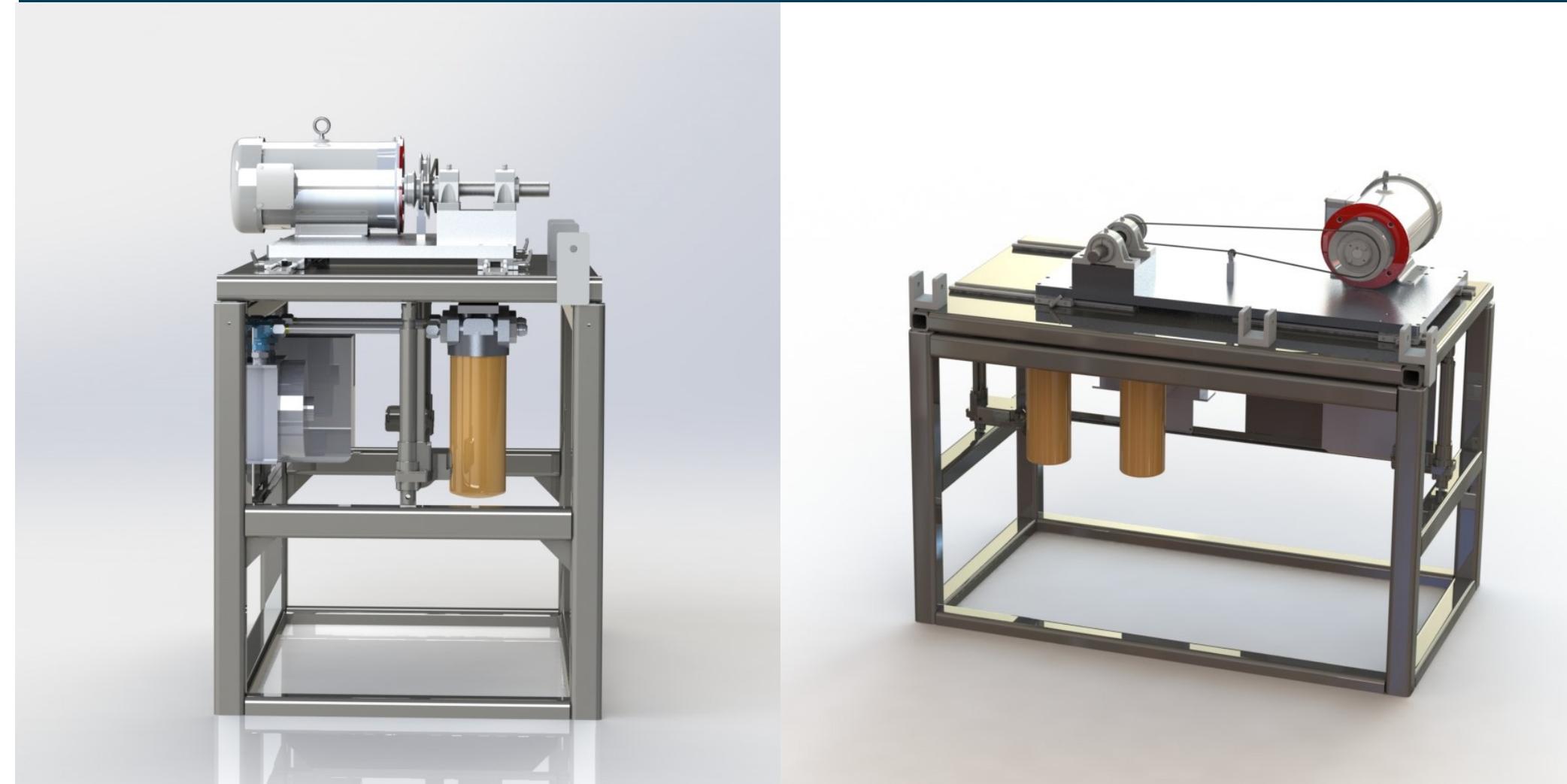
Create a helicopter transmission test stand that meets the requirements set by Able Aerospace.

The improved test stand will operate at the desired 6600 RPM, compile data acquisition from transmission output sensors, generate a service report for documentation, and utilize a user-friendly ergonomic design.

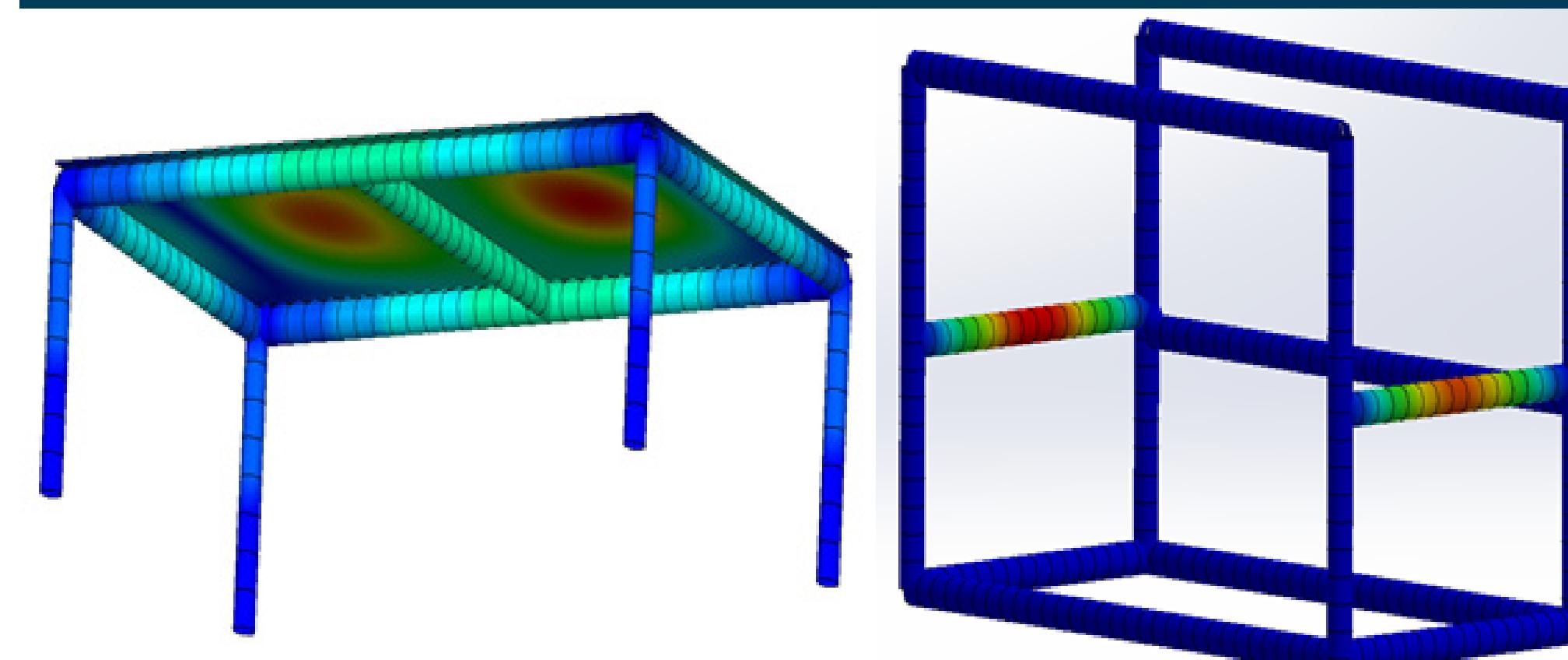
## Background

Able does a complete overhaul on numerous Bell military and multipurpose utility helicopters. The wide range of duties that these helicopters serve with affect public safety in more ways than what the everyday person would consider. Though some of the Bell helicopters are no longer in production from the manufacturer, that does not mean that they have reached the end of their lifespan. All variants of Bell helicopters that Able does complete transmission overhaul on have the option to be outfitted as a Helicopter Emergency Medical Service (HEMS) transport device. University of Utah AirMed is a proud purchaser of the Bell 407 helicopter, there are three in their fleet of six, and have carried on the same mission of providing higher quality of service to their patients for decades now. When transporting a patient in critical condition, it is of paramount importance that one of three helicopters does not have a transmission failure. Bell helicopters might have the capability to run without any transmission fluid for up to thirty minutes, but that does not mean that the pilot can land safely within thirty minutes.

## Preliminary Design

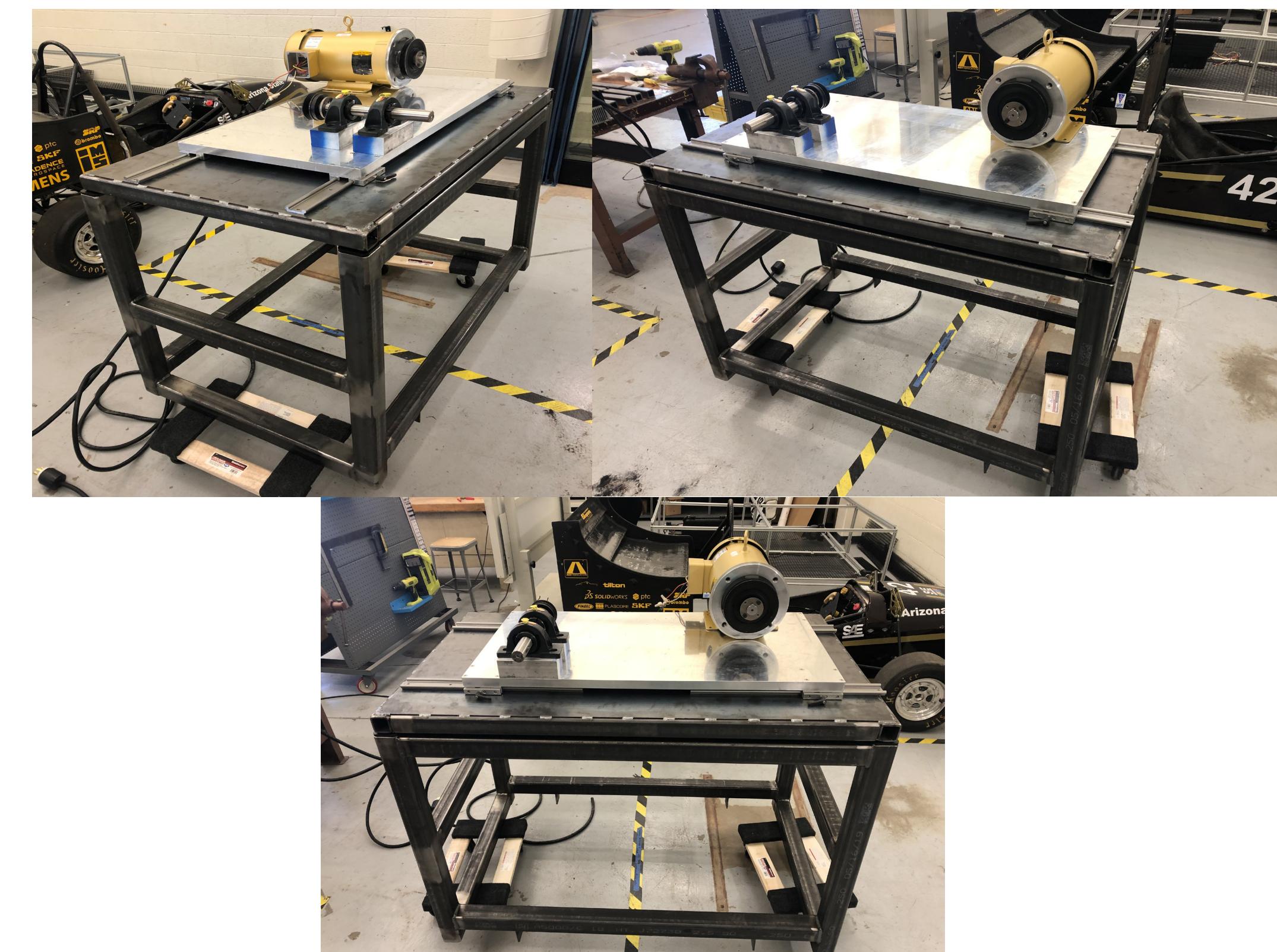


## Analysis



## Final Deliverable

The final design of the helicopter test cell will be able to adapt to multiple gearbox varieties and will be able to achieve the desired target RPM of 6600 through the use of a 2:1 overdrive assembly. When delivered, the stand will be manually operated, requiring the operator to control the speed of the motor through a Variable Frequency Device and operate height adjustments through a hand-held switch controlling two electric linear actuators.



## Optimization

Further modifications will be made to the test cell once delivered to Able Aerospace. DASYLab Software is to be used to fully automate the testing process with data collection to supply the customer by showing the testing process.