



FUTURE REPAIR AND MAINTENANCE
FOR AEROSPACE INDUSTRY

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Completion of test rig

FINAL DRAFT

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Executive summary

Introduction

This document provides a general description of the test rig that will be used to conduct experiments in WP4 and what are its capabilities. Additionally, this document includes a detail description of the acceptance testing to which individual components, subsystems, and the fully assembled test rig will be subjected.

Test rig technical description

The test rig is comprised of five main subsystems: mechanical system, lubrication system, electric system, Data Acquisition System (DAQ), and controls system. The mechanical system is comprised of the transmission and the mechanical brakes installed for emergency stops. The transmission includes the replica of the differential used in an Integrated Drive Generator (IDG). The electric system provides mechanical power to the transmission (motor) and also acts as a load (generator). The lubrication system is fully controllable and allows for experiments to be conducted in which lubrication faults accelerate the degradation of the differential. All data from sensors and the electrical system are collected using a DAQ system that is connected to a PC. The test rig is controlled through the same PC using LabVIEW™.

Test rig capabilities

The test rig, whilst designed to conduct all necessary test to complete WP4 successfully, can perform a wide variety of tests. These tests can be divided into six main categories: degradation tests, seeded fault tests, lubrication tests, imbalance tests, electric system tests, and acoustic emission tests.

Acceptance testing

This section provides a detailed description of all tests to be conducted on all components purchased for the test rig as well as for the different subassemblies and the final assembly. All emergency procedures are also to be tested following the guidelines included in this document. Some tests will be first conducted using the control interface simulating different operating conditions and then repeated in real life to ensure all safety systems operate as required.