

Full-Scale Fatigue Testing from Structural Analysis Point of View

Yudi Ardianto¹, Derk Daverschot¹, Paul Mattheij¹, Mathias Renner², Manuel De Araujo³

¹*Airbus Operations GmbH, German*

²*Airbus Defence & Space, German*

³*Airbus Operations SAS, France*

Generally speaking, full-scale fatigue tests are used to demonstrate ‘Means of Compliance’ (MoC) for Type Certification. Aircraft are designed in accordance with fatigue and damage tolerance requirements, and the main purpose of the fatigue test is to provide the physical evidence necessary to validate the design.

These tests, which are located at the top of the test pyramid, come with significant investment. The test objective is therefore not limited to compliance with the regulations only, but also aims to obtain a large amount of important experience with the structure that will benefit future applications.

This paper presents the structural analysis side of full-scale fatigue testing, which drives large parts of the test definition, execution, exploitation and use of test outcomes.

Evolution of the general fatigue test approach, alignment of fatigue requirements with test execution and exploitation of the test results for all Airbus airplanes is explained. Also future development in full-scale fatigue testing will be outlined.