

Innovations and Industrial Technologies 2025

Development of a prototype and construction of Poland's first next-generation passenger aircraft training simulator.

POIR.01.01.01-00-0140/19

FTD.aero Sp. z o.o.

ABSTRACT

The objective of the project was to design, construct, and prepare for certification the first next-generation flight simulator for a midsize passenger aircraft developed in Poland.

Project scope and structure

The project consisted of two main research and development components: software and hardware.

In the software component, the main activities focused on developing the necessary tools and a dedicated software environment capable of communication with all Original Equipment Manufacturer (OEM) components. In the subsequent stage, a complete and functional simulation environment was created. This included replication and simulation of the entire navigation system, external world visualization, the Instructor Operating Station (IOS), and all functional elements required for a certified Flight Simulation Training Device (FSTD).

In the hardware component, the work was divided into several task groups aimed at the precise replication of the cockpit's physical pilot interface, the re-engineering and adaptation of OEM component functionalities, and the integration of OEM components into a complete simulator system.

The fully functional FSTD prototype was created as a result of the project.

OBJECTIVES

The project, being a complex undertaking, had as its main objective the construction of a prototype simulator and the verification of its potential for certification in accordance with EASA CS-FSTD(A) regulations.

To achieve this goal, key milestones were defined to conclude individual R&D subprocesses aimed at developing the essential technologies required for the construction of highly advanced flight simulators.

These milestones included:

- Development of a technology for adapting decommissioned OEM equipment for use within the simulation environment;
- Development of a technology for the functional reconstruction of individual cockpit modules and panels;
- Construction of a software environment for an FSTD of class FTD 2;
- Development of a testing methodology for the target device in accordance with CS-FSTD(A) requirements.

ACKNOWLEDGEMENTS

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CONCLUSIONS

As a result of the project implementation, FTD.aero developed and integrated into its own production processes an innovative technology for the construction of advanced, professional flight simulators.

The prototype simulator was built, test-flown, and certified by the Polish Civil Aviation Authority.

The simulator has proven its effectiveness and applicability in pilot training processes within a major airline.



REFERENCES

- POIR.01.01.01-00-0140/19 Project documentation.
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- <https://www.easa.europa.eu/en/document-library/certification-specifications/cs-fstda-issue-2> CS-FSTD (A)

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