

ABSTRACT

The project was about developing and constructing a simulator for training licensed aviation personnel based on generic components.

The innovative approach to building a professional flight simulator (FSTD), involves the development of a generic simulation engine, which, as a universal tool, can serve as an interchangeable component in the construction of simulators for different types of passenger aircraft through parameterization and discretization.

The simulator's hardware layer was developed as universal electronic components (PCB), which, like the generic simulation engine, can be parameterized and adapted depending on the specific requirements defined by the type of aircraft being simulated.

This generic approach to simulator construction technology represents a breakthrough innovation, allowing for the significantly faster development and production of simulators for different aircraft types. It enables the introduction of simulators to the market that, due to the labor-intensive nature of their development, were previously unavailable despite market demand or were disproportionately expensive (serving niche markets).

The simulator developed within this project is the first in Poland to be created using generic components and offered to airlines as well as specialized pilot training centers. The results of our R&D project will be fully and directly utilized in the operations of FTD.aero.

OBJECTIVES

The objectives of the project were achieved mainly through its R&D phase, which included the following key activities:

- **Development of a universal electronic** component capable of supporting, communicating, and cooperating with a variety of peripheral devices installed in the FSTD.
- **Development of a generic simulation engine** designed for software customization. The adjustment and tuning of the simulation engine were based on OEM data and verified through selected QTG objective tests.
- **Integration of the developed technologies** into a fully functional FSTD.
- **Verification of certification feasibility** under CS-FSTD(A) as an FTD Level 2 device.

ACKNOWLEDGEMENTS

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CONCLUSIONS

As a result of the project realisation and implementation, FTD.aero developed and integrated into its own production processes an innovative technology with generic IO38 and IO24 interface cards and generic simulation engine capable of high-fidelity customization.

The prototype simulator was built, test-flown, objectively and subjectively verified according to CS-FSTD(A).



REFERENCES

- POIR.01.01.01-00-0754/21 Project documentation.
- <https://ulc.gov.pl/personel-lotniczy/certyfikacja-organizacji-i-rejestracja-podmiotow/urzadzenia-fstd>
- <https://www.easa.europa.eu/en/document-library/certification-specifications/cs-fstda-issue-2> CS-FSTD (A)

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