

## PZL M28 Airplane Service Life Extension Activities

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The PZL M28 airplane is a twin-engined high-wing strut-braced turboprop STOL airplane of metallic airframe, unpressurized fuselage, twin vertical tails and a tricycle nonretractable landing gear. The airplane is certified in commuter category of 14 CFR Part 23 and is used mainly for local transport in extreme conditions (high altitude & hot climate, unprepared airstrips). The FAA Type Certificate was obtained in 2004, and the EASA Type Certificate was obtained in 2005.

One of the important aircraft economic parameters is an airframe service life. The PZL M28 service life has been established based on full-scale fatigue tests performed in PZL. As the M28 airframe is a modification of that of An-28, which had been developed at Antonov bureau in Kiev since the sixties, PZL concluded that the damage tolerance philosophy was not applicable, and the safe life philosophy was applied to main structural elements. Initial results of airframe fatigue tests (service life of 8000 flight hours / 8000 cycles) were assessed as not satisfactory, so local structural modifications were implemented, which allowed for a significant increase of airframe service life.

Fatigue tests were conducted on:

- Wing and wing-loads-carry-through structure;
- Empennage;
- Landing gear;
- Engine mount.

During the service life extension campaign structural modifications were implemented in wing, main landing gear beam (integral part of fuselage) and horizontal tail stabilizer. A new main landing gear of higher service life was implemented as well.

*Keywords: fatigue test, fatigue analysis, ageing aircraft*