COMMERCIA L ENGINE S

YAKO VLEV TAKES PROPFAN LEAD

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akovlev's Yak-42E-LL propfan
testbed flew for the first time on 15
March at a flight-test centre near
Moscow. It is the first propfan-
powered aircraft built as part of an in-house development programme at a Soviet aircraft design bureau.
The new team heading Yakovlev regards propfan aircraft development as a key ele-ment of future bureau activity. Alexander Dondukov, at 37 the youngest general designer in post-war Soviet aviation, took over as head of Yakovlev in February. He has been in charge of the bureau's propfan research from its outset.
Vladimir Dmitriev, Yakovlev deputy gen-eral designer responsible for research and development, explains: "For several years the Soviet Ministry of Aircraft Industry has been conducting a wide-scale research pro-gramme to explore the feasibility of a number of fuel-saving technologies. Several Soviet research and design organisations contributed to this programme, [in the course of which] the main propfan research and design work was performed".
An Ilyushin 11-76, modified at the State Research Institute for use as a propfan

While development of fuel-saving

propfan engines languishes in the West, work continues in the Soviet

Union where recent fuel shortages have underscored the need for new

engine technology. Boris Rybak

reports on new developments at Yakovlev.

testbed, marked the first practical step by Soviet industry. One the Il-76's four tur-bofans was replaced with a Progress D-236 gearedpropfan, similar to that now fitted to the Yak-42E-LL. Other Soviet design bu-reaux are also evaluating their own propfan-powered designs, using results from the 11-76 tests as well as data obtained at Sovietresearch centres such as TsAGI, TsIAM and VIAM.
Dmitriev says: "The Yak-42E-LL intro-duces a new step in this direction. The propfan design environment is much more

Progress D-236 propfan prototype windmilhng on Yakovlev Yak-42E-U testbed

realistic here than on the 11-76 testbed. Our aim in this programme is somewhat two-fold. We are trying to get solutions to the fundamental problems of propfan design as well as to gain real operational experience with a propfan-powered aircraft.
"Based on this experience, we will be able to cope effectively with a number of inher-ent propfan-induced problems revealed dur-ing research...both in the Soviet Union and in Western countries. The results of our programme could be used by other design bureaux, which cannot afford such an expensive testbed," he offers.
Yakovlev officials are aware of the basic feasibility of propfan designs but emphasise the need to solve several design problems efficiently. Vibration is considered the most critical problem inherent in a propfan-powered aircraft.
Dmitriev says: "A high level of comfort in the passenger cabin — a low-noise, no-vibration environment — is a must for an
air carrier. [Up to now] this problem has
not been solved definitively for propfan-
powered aircraft. [When compared on these
criteria] propfan aircraft appear to be infe-
rior tq today's jets."

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