

# Taking the Leap



## The Russian T-50/PAK-FA

**T**he Sukhoi Company has completed the preliminary on-land and in-flight activities which involved all three engineering prototypes of the Frontline Aviation Advanced Airborne Complex (PAK-FA) 5th generation aircraft. These prototypes were used for testbed strength tests, on-land optimisation of fuel systems and other work towards flight trials. The flying prototype has made 16 flights and as of August 2010, “the optimisation of aircraft and its safety systems has enabled execution of a complete programme of flight trials,” stated Director General of Sukhoi Mikhail Pogosyan.

The PAK-FA first flew on 29 January 2010 at Komsomolsk-na-Amur in Russia’s Far East. The acceptance trials of the flying prototype were “fully completed” in late March. In April the

first flying prototype of the fighter and the avionics testbed used for systems optimisation before flight trials were delivered to the flying test centre of the OKB Sukhoi Experimental Design Bureau at Zhukovsky near Moscow. Upon completion of the required on-bed preliminary tests of the systems, including the static example’s strength testing, on-land optimisation of the avionics testbed and of the flying prototype. On 29 April the aircraft started preliminary tests.

Compared to the previous generation fighters, the PAK-FA features a number of unique capabilities, combining functions of a strike aircraft and fighter. This fifth-generation aircraft is fitted with essentially new avionics integrating the function of “an electronic pilot” and with an advanced phased antenna array radar.

“This considerably reduces the pilot fatigue, enabling the pilot to concentrate on performance of the tactical mission. The new aircraft’s onboard equipment makes it possible to exchange information in the real time mode both with on-land control stations and with aviation group aircraft. The use of composite materials and innovative technologies, and the aerodynamic streamlining ensure unprecedented radar, optic and infrared stealthiness. This significantly enhances the operational capability against aerial and ground targets in all weathers, day and night.”

Vladimir Popovkin, Russian Defence Minister First Deputy, has in an interview estimated that the Russian Air Force’s demand for the 5th-generation fighters will be 50 to 100 units. It is planned to



The fifth generation design aspects of the T-50 seen as the fighter does a ground run.

complete all tests of the PAK FA airframe in 2011-2012 and to sign a contract in 2013 for an initial lot of ten aircraft for testing the T-50's entire weapons suite.

#### To Zhukovsky

Flight-testing of the Sukhoi PAK-FA prototype, '51 Black' (T50-1), has since been transferred, as planned, from the KnAAPO factory at Komsomolsk-na-Amur to the Gromov Flight Research Institute airfield at Zhukovsky, near Moscow. The initial six test flights were undertaken at Komsomolsk-na-Amur, enabling assessment of basic stability and controllability of the aircraft, engine and major systems testing and initial expansion of the flight envelope. The aircraft was then dismantled and loaded onto an An-124 transport aircraft before being flown to Zhukovsky. The An-124 also carried one of the ground test airframes, the T-50 KNS (*Kompleksny Naturny Stend* - Complete Full-Scale Model), to Zhukovsky at the same time for further ground testing. Although not intended to fly, the T-50 KNS is fully equipped with engines, equipment and operational systems and was used for taxi tests at Komsomolsk prior to the prototype's first flight.

After re-assembly and further ground checks, test pilot Sergei Bogdan re-flew the PAK-FA from Zhukovsky accompanied by an Su-24M chase aircraft, before landing back there after a 39 minute flight.

VSC

## Quo Vadis India ?

Preliminary testing of the Sukhoi T-50 PAK-FA (*Perspektivnyi Aviatsionnyi Kompleks Frontovoyi Aviatsii* or Future Frontal Aviation Airborne Complex) has been completed, according to an official announcement. Flight trials have involved both the first flying prototype (T-50-1) and three ground-based engineering prototypes, comprising a structural test airframe (T-50-0), a ground test article (T-50-KNS, *Kompleksny Naturny Stend*, Full Scale Model) and an avionics testbed (T-50-2).

A second flying example is due to enter the test programme before the end of 2010, followed by a third and fourth in 2011. Flight trials are predicted to continue into 2012. An order for ten pre-production T-50s is expected to be placed in 2013 for operational testing and between 50 and 100 could eventually be acquired for service with the Russian Air Force. The total requirement was initially for 420 to equip ten regiments.

According to reliable sources in New Delhi, India's workshare for this fifth-generation fighter aircraft will amount to about 30 percent of the overall design effort and will concentrate on composite structures, advanced electronics including the mission computer, cockpit MFDs, and electronic warfare systems. HAL are also reportedly to work on the 2-seat version, the Indian Air Force having confirmed their preference for such configuration as with the Sukhoi Su-30MKI, some 270 of these aircraft ordered from Russia.



Portrait of the future: the T-50 PAK-FA in flight.