

# SP's Shownews



A SP GUIDE PUBLICATION



**AERO INDIA 2007**  
6th International Aerospace  
& Defence Exhibition

Friday, February 9, 2007

Visit us at Aero India '07, February 7 to 11, at Booth no. D1.5 to D1.7 in Hall D

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## Aero India 2007 Opens

After establishing credibility over the years, the sixth edition of Aero India took off in clear blue skies on February 7. The dignitaries got a rousing welcome with the Air Warriors Symphony Orchestra of IAF heralding the arrival of the Indian Defence Minister, A K Antony with the customary 'Fanfare'. Besides the Defence Minister the list of VIPs included Chief Minister of Karnataka H D Kumaraswamy, Minister of State for Defence, Pallam Raju, Minister of state for Defence Production, Rao Inderjit Singh, Chief of the Air Staff, Air Chief Marshal S P Tyagi, Defence Secretary, Shekhar Dutt, Secretary Defence Production, Mr K P Singh and President FICCI.

As per Secretary, Defence Production this year's Show is the largest in the Asian region.

Apart from large scale participation by aerospace companies, 15 delegations and as many as 28 chiefs of different

contd on page 4...



Arrival of VIPs (above).

Defence Minister addresses the gathering (below).







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Printed in India by Pragati Offset

© SP Guide Publications, 2007  
SP GUIDE PUBLICATIONS P Ltd  
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Tanking up in the air: IL-78 with IAF Mirage 2000s (top). Corporate colours of the event: Ratan Tata arrives at the inaugural ceremony.

...contd from page 1

Air Forces of the world were also present.

A seminar on Civil Aviation with emphasis on business aviation has also been organised. He stated that the Air Show would give tremendous opportunities to the participants for joint ventures and technical tie-ups as Bangalore was akin to 'Ground Zero of Indian aviation industry both in terms of research and production.

The Chief Minister of Karnataka, HD Kumaraswamy stated that the aviation sector in India is booming in India, specially in Karnataka where as much as Rs 40,000 crore (US \$9.5 billion) were needed only for infrastructure. He emphasised the need of

public-private partnership for the necessary capital investment and welcomed FDI. He said that Bangalore International Airport was a fine example of such a joint endeavour and promised that the participants would be landing there for Aero India 2009.

The Defence Minister reiterated India's desire to maintain peace and stability in the region through diplomacy and military deterrence and win the war against terror. He said that India was gaining the economic strength to play a grater role in Asia for which it was poised to acquire state-of-the-art weapon systems to modernise its armed forces. He invited the exhibitors to join India in a long-term

partnership both through offsets and FDI. He said that capabilities of the Indian aviation industry was on display and exhorted the Indian aviation industry to think 'global' but act 'local' to help the country in its quest for self-reliance in defence preparedness. Declaring Aero India 2007 open, he stated that the next show will be held at the same venue from February 11 to 15, 2009.

What followed was one of the most spectacular air displays ever witnessed in the Indian skies. The IAF led the show with a precision flypast and aerobatics display by a Su-30MKI, the Sarang helicopter team and the legendry Surya Kirans. The rest of the air display was equally scintillating but the F/A-18 Super Hornet and the MiG-29N OVT were truly outstanding. •

# Hot



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## Honeywell



## Preserving World Peace With Aerospace Power

New Delhi has probably never seen so many air chiefs under one roof. Chiefs of 40 air forces from across the world gathered in the Indian Capital to discuss the changing nature of air warfare. The occasion was the 'International Seminar on Aerospace Power in Tomorrow's World', one of the events organised to mark the platinum jubilee year of the Indian Air Force. External Affairs Minister, Mr Pranab Mukherjee used the occasion to make an appeal to the international community to keep space free of weapons. Although he did not specifically name China, Mr Mukherjee's remarks were a nuanced Indian disapproval of the recent

Chinese missile test-firing to destroy a satellite in space.

In his inaugural address, the minister said: "Recent developments show that we are treading a thin line between current defence-related uses of space and its actual weaponisation. While the focus on aerospace power is natural in today's circumstances, it is in our common interest to preserve outer space as a sanctuary from weapons and guard it as the common, peaceful heritage of mankind."

"India has invested heavily in the peaceful uses of space and has a well-diversified and growing civilian space programme that answers to our development needs in education, telecommunications, remote

sensing, management of natural resources and other areas. The recent successful launch of multiple satellites and recovery of a re-entry capsule are illustrations of the depth and diversity of this programme," he added. Indian Air Force Chief, Air Chief Marshal S P Tyagi renewed IAF's case for fast-tracking the setting up of an aerospace command.

The seminar showcased what the world's military aerospace leadership is thinking.

"Increasingly, the security challenges that we're all facing require an international effort. So, the better we understand what our individual capabilities are, and how we can complement each other, I think that the important area," Air Chief Marshal Glen Torpy, Chief of the Royal Air Force, said.

For India, it was an opportunity to project itself as a force for peace and stability. Its role got a vote of approval from the world's biggest military. "One would expect that the Indian



External Affairs Minister Pranab Mukherjee in joyous mood with ACM Tyagi (above). ACM Tyagi with foreign air chiefs and his successor (left).



Air Force would grow like the other services in India to continue to provide the oversight for cooperation among the countries in the region for peace and stability," US Air Force Chief-designate General Paul Hester added. •

*Note: A detailed coverage will feature in SP's Aviation 1/2007.*

### Raytheon and Tata to collaborate

Raytheon has signed a memorandum of intent with Tata Power Strategic Electronics Division. The agreement is designed to encourage collaboration in areas of complementary expertise and experience as a first step toward forging new relationships with a range of Indian technology companies. The electronics division of Tata Power is viewed as a good fit with Raytheon's core business, according to Wes Motooka, vice president for international business development at Raytheon Space and Airborne Systems. He expects the flexibility of this joint approach to allow both companies to respond effectively to address emerging opportunities. Rahul Chaudhry, CEO of Tata Power SED, noted that it "has harnessed its multi-disciplinary capabilities required for defense systems for more than four decades. "Engaging with a world leader like Raytheon will bring the benefits of scale and experience to Tata Power SED, allowing us to leverage the offset and other business opportunities, thus enabling us to serve our customers better."

### Aero Club of India (ACI) inks a deal with Cessna for trainer aircraft

Aero Club of India on February 7 signed a deal to purchase eleven Cessna 172 with Glass Cockpit.

These aeroplanes will be utilized by ACI member flying clubs throughout the country to meet the demand for training pilots and engineers. Delivery will start in September 2007 and will be completed by December 2007.

The deal was signed between the President of Aero Club of India and Senior Vice President Sales and Marketing of Cessna, USA.

Cessna 172 has better features than the already in use Cessna 152s.

Aero Club of India is the apex body which has been promoting civil aviation and aerospots since 1928. Captain Satish K Sharma took over as President from Late Indian Prime Minister Rajiv Gandhi and has been in the chair for the past 20 years.

# Hotter



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## Honeywell



# Rendezvous with Eurofighter CEO

Mr Aloysius Rauhen spoke to SP's Show News on their plans for business in India

**A**s the name suggests the Eurofighter has an European identity and from the list of countries involved in the programme, it is clear that it is purely an European effort. Could you kindly explain as to why France with a highly developed aeronautics industry in Europe is not a part of this highly prestigious European project?

Before the four Partner Nations started the development of Eurofighter Typhoon, France indeed was involved in the project. But it was France who decided to withdraw from the project and go their own way to develop a slightly lighter aircraft with full French authority.

**What is the state of the Eurofighter production schedule? How many aircraft out of the 620 on initial order have so far been delivered and who are the recipients?**

The Eurofighter consortium is under contract for production of 620 aircraft for the four partner nations and 18 for Austria and has delivered a total of 114 series production aircraft to date. Deliveries to the four partner nations have begun in 2003, 109 aircraft are in operation with the air forces of Germany, Italy, Spain and the United Kingdom. Five additional series production aircraft are in service with industry for test and evaluation purposes. Austria is to receive aircraft starting at the end of May this year.

**It is understood that clearance for production of the third batch of Eurofighter Typhoon of the initial order is contingent on restructuring of BAE. What are the conditions set by the British government for the proposed exercise?**

It is true that we will start negotiations with the customer on the production go-ahead for the third Tranche of further 236 aircraft very soon. I cannot share your view on the UK aspect. As a first step the four nations have to agree on a common approach, namely on requirements and speci-



We already have five air forces as customers and quite relevant ones at a relatively early stage of the operational phase that we expect to last over 40 some years. So there is a lot of potential for us. Certainly no Western European competitor is in such a favourable position.

fications before they enter negotiations with industry. And I therefore would not like to speculate.

**What are those features in this Fifth Generation Fighter aircraft that make it unique as compared to the F 22 Raptor, the F 35 JSF or the Rafale?**

The Eurofighter Typhoon is designed from the outset as a true multi-role/swing-role fighter aircraft, enabling a one type fleet. As emphasis was put on the air-to-air capabilities as main design driver, it clearly is superior to all competitors in this role

with the exception of the F-22, which has a slight edge over us in aerial combat as a lot of simulations have proven. They win 91%, we win 82% in aerial combat, but with a significant difference in cost. The next competitor follows with 50%. But then Eurofighter already at this stage has proven its capability in air-to-ground operations with configurations flown in aggressive maneuvers with six missiles, six Paveway LGBs and a centerline tank. This is unique.

**Does your company propose to respond to the RFP by the Indian Air Force for 126 Multi-Role Combat Aircraft? How do you propose to display the Eurofighter Typhoon at Aero India 2007?**

Of course the Eurofighter consortium intends to respond to the expected RFP and is receiving great support for this from the partner nations. Government and air force delegations from the partner nations are expected to attend Aero India and will definitely highlight their air forces experience with the Eurofighter Typhoon. The aircraft is in service since early 2004 and the air forces are focused on achieving the operational readiness to assign their first units to NATO this year and early next year. Therefore training of pilots and ground crew has absolute priority for them and this exactly the reason, why we will not have a Eurofighter Typhoon aircraft at Aero India this year. But the air forces do support our efforts by inviting potential customer air forces to fly the aircraft. The German Air Force and the Royal Air Force had invited the Chief of Air Staff and the former Vice Chief Indian Air Force to fly the aircraft and they did. At Aero India we will have a stand with what we call a Cockpit Demonstrator, a bit more than a simulator. It is a real cockpit that enables simulation of air-to-air and air-to-ground missions with the helmet mounted sight and many future growth features.

**The Eurofighter Typhoon has in the re-**



# Hottest



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# Honeywell

cent past been in the news related to a \$ 12 billion deal for 72 aircraft with the Kingdom of Saudi Arabia in which the British government has been in the line of fire for putting commercial and strategic interests before ethics. Would you like to comment on this and as to the number of aircraft, the timeframe in which the deal with Saudi Arabia would be completed and whether the French are competing with the Rafale?

The governments of the Kingdom of Saudi Arabia and the United Kingdom are in negotiation on this issue. As you are aware they signed an Understanding Document in 2005, which is intended to establish a greater partnership in modernising the Saudi Arabian Armed Forces and developing close service-to-service contacts especially through joint training and exercises. Under the terms of the signed document Typhoon aircraft will replace Tornado Air Defence Variant aircraft and others currently in service with the RSAF. In August 2006 the governments of Saudi Arabia and the United Kingdom have announced that they have agreed the required commercial principles which will effectively initiate the purchase of Typhoon aircraft and the associated commitment to the industrial plan to be launched. I would ask you to direct your questions to the government representatives.

**It has been reported that the Austrian government is contemplating cancellation of the order for 18 aircraft placed earlier. What is the current position?**

Eurofighter GmbH as the management company for the programme is contract holder for the Austria contract. This is a valid contract and the consortium is delivering to the contract. Therefore we don't see any reason for a pullout. The new government in Vienna is fully aware of our position.

**It is understood that Denmark and Norway were planning to purchase the Lockheed Martin F 35 JSF. Does this move reflect lack of confidence in their home product? Are there any plans to sell the aircraft to Turkey?**

Some of the Eurofighter partner nations are to procure the F-35, Italy and the United Kingdom, mainly to meet their requirement in the naval air warfare to staff their aircraft carriers. Other nations that are taking part in the development phase

of the F-35 have mentioned their interest in our programme, as they feel their expectations on operational capabilities and industrial participation may not be met by the US project. That goes for the three nations you mentioned. Norway has since some years now invested own budgets to take part in the development of technologies required for Eurofighter Typhoon. The participation of Norway and Denmark in the next phase of the JSF development program should not be misunderstood as a decision to procure this aircraft. Norway made very clear that they consider as well the Eurofighter as a candidate and considers to increase its investment in industrial development packages.

**In an interview you have been quoted as saying 'We aim to terminate the main development of our weapon system and, at the same time, continue developing new functionalities that will deliver the urgently needed capabilities required by our customers. This will ensure that Typhoon's superiority in the international competition is maintained.' Could you elaborate on specific terms as to what further steps are being taken in the development programme?**

The work based on the main development contract will be finished mainly at the end of the year. But of course development work for future capabilities and future growth will have to be maintained. So we are currently assessing with our main customer, the NATO Eurofighter Management Agency NETMA, what kind of resources will be required to perform this work. As the basic design has proven its maturity, we aim at mainly integrating new weapons into the system like Meteor, stand-off weapons, and improve the systems.

Major hardware changes that we expect is the integration of an electronic scanning radar antenna that the Euroradar consortium has under development with successful first flights in a testbed already done and flights with Eurofighter Typhoon planned for the very near future.

**The Eurofighter Typhoon manufacturing programme has four separate assembly lines with each of the partner companies assembling its own national aircraft, but builds the same parts of all 620 aircraft . How do you ensure quality control in this complex arrangement?**

We have a simple arrangement: Produc-

tion is based on single source and quality control rests with the manufacturer. Final assembly by each Nation is a customer requirement. And the national authorities supervise this process. The manufacturer of the components and the equipment bears responsibility for the functionality of his parts. If it fails, it goes back and he has to deliver a new part.

**The Republic of Singapore Air Force (RSAF) dropped the idea of buying the Eurofighter Typhoon as 'the committed schedule for the delivery of the Typhoon and its systems did not meet the requirements of the RSAF'. Could you comment on this please ?**

The Eurofighter consortium had briefed the Singapore authorities very comprehensively and also an in country evaluation had demonstrated the potential of Eurofighter Typhoon. But as you rightly say, in the end Singapore wanted some capabilities that Eurofighter Typhoon will certainly have in the near future, but we were not ready to commit earlier.

**Could you give us some idea of the extent of cost overrun since the commencement of the Eurofighter Typhoon project?**

We refute these allegations. As the main contracts for development and production are fixed price contracts there was simply no cost overrun that industry was responsible for. Additional customer requirements and additional orders have indeed raised costs for some nations.

**A few years ago you have been quoted as saying "Eurofighter Typhoon is the biggest and most successful military aerospace programme in Europe. With 638 aircraft under contract to five nations Eurofighter GmbH holds the largest order book of any next generation fighter aircraft worldwide, making Eurofighter Typhoon the undisputed Number One in the global fighter business'. Do you hold the same view today?**

This situation has not changed. When we look at other next generation fighter aircraft, the order book still tells the same story. And we are very confident that in respect to European competitors this will not change over the years. We already have five air forces as customers and quite relevant ones at a relatively early stage of the operational phase that we expect to last over 40 some years. So there is a lot of potential for us. Certainly no Western European competitor is in such a favourable position. •





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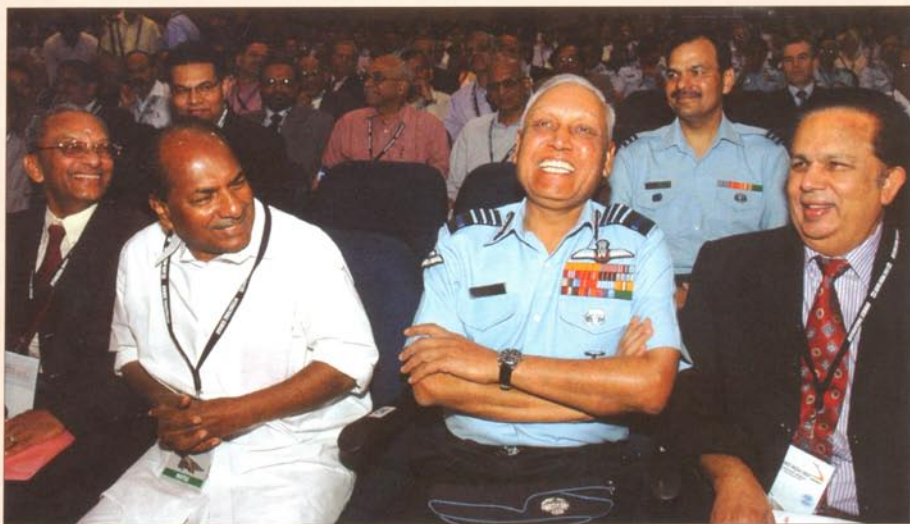
## Aerospace Technologies – Meeting the Challenges

**S**eminar on 'Aerospace Technologies – Challenges and Opportunities' was inaugurated by Mr A K Antony, Defence Minister. While he – in the Presidential Address - stressed the need to achieve a balance between 'guns and butter'. Both the Scientific Advisor M Natarajan and IAF Chief, Air Chief Marshal S P Tyagi demanded more funds to expand research and development as well as the air arms. Anthony hinted on upcoming collaborations at international front. He also promised 'transparent' deals.

A set of hundred engineers from academia as well as delegates were present during the seminar. ACM Tyagi said that geo-economics is more important than geopolitics' adding 'diplomacy without military muscle is useless'. Aerospace power is needed not just as a deterrent but also to 'punish'. If the 19th century was more of 'sea power' the 20th ushered in 'air power'. India needs aerospace power to keep it as a 'deterrent'. He reiterated, 'armed forces is to prevent war – not just to fight wars'.

Indigenising of arms not only brings in 'pride' but as Natarajan said, it paves the way for Rs 100 billion worth of industrial growth which is likely to rise to Rs 250 b in the next ten years. He pointed out that in USA each US\$ 1 billion investment in defence related industry equals 22,000 jobs. Asked 'Why should Trishul Missile project be abandoned, after the effort and gain in knowledge? It can still produce a sea-skimming missile and a sea to air missile' he replied, 'we are opening a dialogue to revive with modification'. The defunct Airborne Surveillance Warning and Control System is to be revived. He mentioned that at Gas Turbine Research Establishment, Kaveri jet engine on the test-bed is 'realising' 90 to 93 % of expected performance.

Defence Avionics Research Establishment will go deeper into and Electronic Warfare and mission avionics development. SA to defence minister listed a few technologies that have been identified



for giving a thrust. Radar warning receivers is another area for development. Supersonic Electronic pod for Sukhoi 30 MKI has been developed.

Initial Operational Clearance for 20 Tejas, the Indian Light Combat Aircraft is sanctioned and the Indian Air Force is likely to place order for one more squadron. LCA is evolving into its naval version and the trainer version. Capability to operate out of aircraft carrier is being developed. LCA trainer will have potential

to perform beyond Hawk, the advanced jet trainer. Natarajan adds, 'Meaningful discussions with aircraft designers is looked forward to during Aero India show'.

Countries, which spend higher percentage of its GDP on R & D are also large exporters of arms. Natarajan called upon private industries to shift more expenditure towards R & D. In Japan about 82 % of expenditure on R & D comes from the private industry. •



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## Colours in the skies of Bangalore



Surya Kirans in formation and in looping manoeuvre (middle). Sarang performing during the show.







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1. MiG-35, 2. F-18, 3. Gripen, 4.  
Su-30MKI of IAF, 5. MiG-29 OVT..



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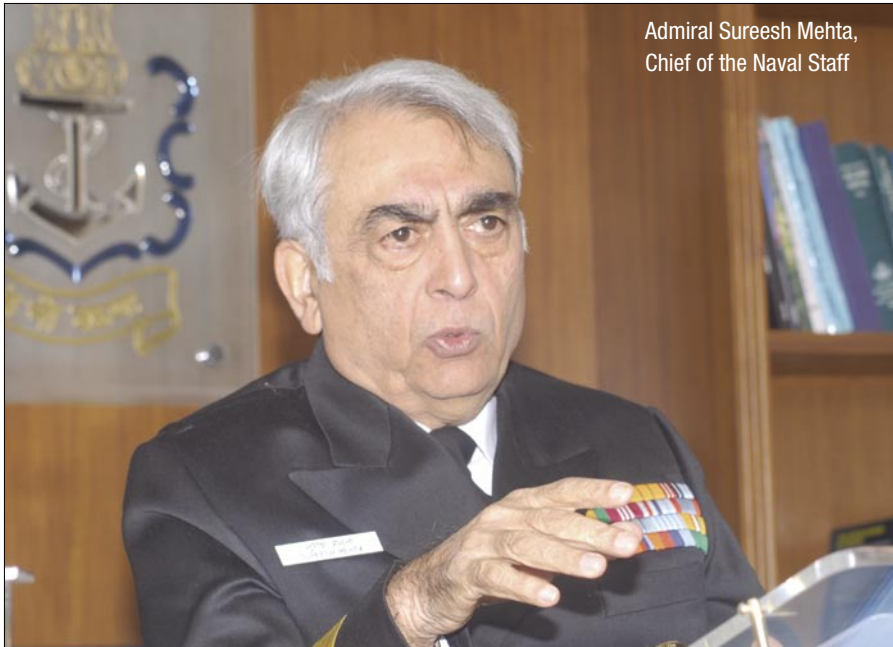
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## Indian Armed Forces

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Admiral Sureesh Mehta,  
Chief of the Naval Staff

## On key priority areas for the Indian Navy during the next few years

Let me first say that the modern, versatile and vibrant navy that we have today is an outcome of progressive development and focussed endeavours undertaken by a bold and visionary naval leadership of the past. It would thus be my endeavour to see this vision bringing fruit in the form of self-reliance in designing, building and maintaining our navy and to keep it on the path of evolving into a modern, capability-based and balanced three-dimensional force with the ability to operate throughout our areas of interest and respond promptly to military threats or benign situations. For this we will give priority to progressing our induction, modernisation and replacement plans. Particular attention will be paid to acquisition of air based surveillance assets and those required for maritime 'domain awareness' and for networking our platforms. Attention to issues

related with improving satisfaction and the aspirations of our manpower, which forms the backbone of our navy, would also be a priority area.

## On modernising of the Naval Air Arm

Modernising our air arm constitutes an important part of our plans. We are planning to upgrade many of our helos, the Sea Kings and Kamov-28, through a mid life update. We also plan to induct more multi-role and ASW helos for the ships under acquisition. We are hopeful that the ALH would meet the replacement needs for light helicopters as they phase out in due course. For the fighters, the Sea Harriers are being given a mid life update and this should see them through until the light combat aircraft (LCA) is ready for induction into the navy. We are also going to induct 16 MIG 29(K) along with the aircraft carrier Vikramaditya scheduled to join the fleet in 2008.

We also need the ability to keep our area of interest under surveillance during peace and war time so as to build up the

strategic and tactical picture and to carry out a realistic threat assessment. This encompasses an area of about 6 million sq km. Surveillance aircraft has the added capability of providing close and distant support to the fleet units. There is thus a clear need to enhance this capability and we have started carrying out mid-life updates of our IL-38 aircraft apart from having acquired two more. We intend to acquire more Dornier 228 for our coastal tasks, and of course, the acquisition of additional long-range maritime patrol aircraft is under process. Hopefully, we will get to replace our ageing TU-142s with more modern aircraft.

## On the pace of modernisation

While we presently have a capable blue water force to undertake this task, we are in the process of supplementing them with additional platforms, like aircraft carriers, escorts and logistics ships. We also have a force imbalance, because a large proportion of the force level comprises "brown-water" units or smaller ships of limited capability. This imbalance needs to be rectified with the addition of more "blue water" capability. Indigenous ship production has now picked up momentum, and 33 ships are on order at Indian shipyards. This includes two new lines of frigates – the Project 17 (stealth frigates of the Shivalik class) and 15A (follow-on ships of the Delhi class), and the Air Defence Ship (ADS). A new line of ASW corvettes is also going to be built. The present budgetary allocations should be able to meet most of India's essential force planning projections.

## On the exploitation of UAVs

We are using UAVs for reconnaissance and they form the innermost layer of our surveillance areas. The UAVs are presently being used in the coastal role on both the East and West coast. We are also examining the feasibility of seaborne operations. •



# MiG-35

## EVOLUTION PROGRAM



The new MiG-35 multi-functional fighter is the latest groundbreaking design from the Russian Aircraft Corporation "MiG". The aircraft features enhanced combat effectiveness and survivability, expandable A-A and A-G weapon suite, improved operational performance.

The MiG-35 sports cutting-edge active phased-array radar and state-of-the-art optoelectronic systems of detection, sighting, navigation and reconnaissance based on space technologies.

The program of development and production of the MiG-35 fighters for the Indian Air Force MMRCA tender envisages full-scale technology transfer and further evolution of cooperation with the Indian industry.



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Program Participants:



Krasny Oktiabr



Nizhny Novgorod Aircraft building  
plant SOKOL



Klimov Company



"Phazotron-NIIR"  
Corporation



Ramenskoye Instruments  
Design Bureau



Precision Instruments  
Research Institute



Chernyshev Moscow  
Machine-Building Enterprise

# Su-30MKI: Ten Years with the Indian Air Force

Ten years have passed since November 30, 1996 when in the city of Irkutsk Rosoboronexport and the Indian Ministry of Defence signed the Contract for delivery to the Indian Air Force of the “gen 4+” fighter with the Irkut Corporation as a main executor of the Contract.

Until today the Su-30MKI Program, when measured in a number of parameters, has no equal in the history of Russian military-technical cooperation with foreign countries. Thus the total cost of all the contracts signed for the Su-30MKI Program, not only with India but also with other countries, exceeds USD 8\$Bln. Furthermore the possibility of signing some new agreements is also being studied. Dozens of the research institutes and hundreds of Russian enterprises have been working and still continue their work on this Program.

The aircraft were supplied continuously according to the D&D phases. The first aircraft in the newest multi-role Su-30MKI configuration were inducted into the Indian Air Force in 2002. In December 2004 Phase-III of the Program was supplied thus finalizing the Contract execution. At the same time the Su-30MKI aircraft of Phase-I & II were upgraded to the technical configuration of Phase-III. It is envisaged after completion the whole of the air fleet of “Su” type operated by the Indian Air Force will achieve unification. This will significantly simplify maintenance of the fleet and improve its combat readiness.

Following the signing of the other “Contract of the century” in December 2000, the Indian Corporation HAL, with the active technical assistance of the Irkut Corporation, is successfully implementing the licenced production of 140 Su-30MKI aircraft.

The first positive results of the Indian Air Force actually operating the Su-30MKI aircraft can now be revealed. The aircraft immediately became the object of national pride for the Indian



IAF's Su-30MKI in flight

military and all the population of the country. The aircraft are engaged in all Air shows, exhibitions and parades held in India.

The ultimate proof of the Sukhoi aircraft flight performance and combat capabilities came from the results of the Su-30K aircraft's participation in the joint Indo-American military exercises “Cope India 2004” where they had to confront the renowned F-15s. According to Indian and US mass media, in the overwhelming majority of air combats (8 out of 10) the Indian pilots gained an impressive victory over their American rivals. In another later exercise the Su-30MKI fighters won all 10 air combats with the Singapore Air Force's F-16s of the US origin. During the “Cope India 2005” military exercises the Indian pilots in Su-30MKIs secured further victories over F-16 fighters flown by the US pilots.

The success of the Su-30MKI air-

craft in India has to a certain extent influenced the Malaysian and Algerian governments' choice when procuring multi-purpose aircraft for their national Air Forces. They too have preferred the modification of the multi-role Su-30MKI aircraft. Furthermore the possibility of the Su-30MKI aircraft acquisition is being considered by several other countries.

The Irkut Corporation Chairman of Directors Board Mr. A.I. Fedorov, who was one of the founders of the Su-30MKI creation Program, says: «This Project has become the landmark in the strategic partnership between Russia and India in the field of aircraft building. From the direct supplies of aircraft and its licence production setup we have turned to the actual cooperation. I'm sure that all the future aviation programs with India shall be implemented with the same top quality for the sake of both our nations. •



# Fighting Obsolescence



The Deputy Chief of the Air Staff, Air Marshal A K Nagalia disclosed IAF's three-pronged strategy for a mid-life upgrade of its fleet

## On the overall upgrade strategy

The IAF has adopted a three-pronged strategy with regard to the mid-life upgrades of its fleets which include avionics upgrades, giving multi-role capability and to extend the useful life.

## On the Jaguar upgrade

NAVWASS Jaguar upgrade: The initial batch of Jaguar aircraft joined IAF inventory during 1979 to 1982. These aircraft are being upgraded with state-of-

the-art avionic systems, referred to as Darin-II system. New avionic architecture is based on twin Mil-1553 B data-bus with two mission computers controlling the avionics, sensor and weapon systems. Jaguar maritime upgrade: A new fire control radar having SAR/ISAR features had been installed on all the maritime Jaguar.

## On Mirage 2000 upgrade

IAF inducted the Mirage 2000 H/TH aircraft in 1985. With no stipulation of calendar life, the aircraft is expected to remain in service for another 25-30 years. The major modification in the upgrade would include: avionics architecture based on both Digibus & Mil-1553 B data bus; new mission computer with increased capacity and processing speed; glass cockpit with active matrix SMDs; wide angle NVG compatible HUD; secure and jam proof communication with data link; helmet mounted display; internal EW suite; and improved HOTAS and sensor

suite.

## On MiG-29 upgrade

MiG-29 aircraft were inducted into the IAF in 1986. Thus a midlife upgrade would include enhancement of internal as well as external fuel; upgrade of avionics and cockpit ergonomics and HOTAS to the pilot; replacement of the AI radar and EW systems with contemporary systems; and enhancement of total technical life of the aircraft to 3500 hrs/40 years from 2500 hrs/20 yrs.

## On Mi-35 helicopter night upgrade

Mi-35 helicopter is the frontline attack helicopter on IAF inventory which lacked the desired level of night capability. To overcome this shortfall, IAF has completed the night upgrade of its Mi-35 fleet.

## On IL-76/78 Aircraft upgrade

IAF inducted IL-76 MD aircraft in 1985 and IL-78 MKI air-to-air refueller (AAR) aircraft in 2003. It is thus planned to upgrade/replace the existing engine, cockpit instrumentation, avionics and communication equipment. •

## In Brief ...

### HAL courts P&W to set up MRO joint venture

Hindustan Aeronautics is set to enter into a joint venture agreement with Pratt and Whitney Canada (P&WC) for an aircraft maintenance, repair and overhaul (MRO) centre in Bangalore. P&WC Commercial-Service Centre's Vice President Claude Lachapelle said, "we have had talks with HAL for a joint venture agreement for establishing an MRO shop for aircraft engines in Bangalore." Lachapelle said the MRO centre, which could service about 150 aircraft engines every year, was likely to come up by the middle of 2007.

### Lockheed Martin bags contract for D5 missile

The US Navy has awarded Lockheed Martin a contract valued at US \$654.9 million for production and deployed system support for the Trident II D5 Fleet Ballistic Missile (FBM) programme work. The contract will include D5 production support, including re-entry system hardware, and operations and maintenance to support the readiness and reliability of missile systems, both deployed aboard FBM submarines and at on-shore facilities.

### Space Based Infrared System

Space Based Infrared System (SBIRS) provides missile warning, missile defence, technical intelligence, and battle space situational awareness data to operational users and the intelligence community. SBIRS introduces new and vital capabilities for the war fighter. The Highly Elliptical Orbit (HEO) payload detects ballistic missile launched from northern polar regions as it operates in a highly inclined elliptical orbit. The first of a new generation of SBIRS sensors, this payload has improved sensitivity to detect dim theatre missiles and can be tasked to scan off pole areas of military interest.

## Eurocopter's vote of confidence

During the recent visit of Norbert Ducrot, Eurocopter Senior Vice President Sales and Marketing-Asia Pacific, at the company's India's facility in Bangalore, an agreement with HAL representatives was carried out to enlarge the production scale of Ecureuil/Fennec. With this, HAL is to become a first line partner for the global supply chain of the world's leading helicopter manufacturer. This further enlarged cooperation is expected to create approx 150 high-quality jobs in the Bangalore region for more than ten years. As Norbert Ducrot points out, "Eurocopter's business focus in India for 2006 and 2007 is to decisively increase our business platform by means of sales as well as by successful industrial deployment. For that reason, we are not only participating in the Indian Army Aviation tender for the reconnaissance and observation helicopters with our proven AS550C3 Fennec, but we are currently discussing numerous opportunities for long-term industrial cooperation with the Indian aerospace industry." Ducrot said, "HAL and Eurocopter are familiar with each other, having worked together in a trustful relationship for more than 40 years. Since the 1960's, HAL has manufactured around 600 Chetaks and Cheetahs, the legendary predecessors to the Ecureuil/Fennec aircraft, under license from Eurocopter."

# MiG latest simulators

**R**AC MiG's recent success in the Asian and African markets has been partially a result of marketing and logistical activities which had previously been for a week point of Russian proposals. One such activity is the training and simulation systems which gain more importance with the aircraft gradually becoming more complicated and expensive.

According to Vladimir Frolov, RAC MiG Chief of the Training program development, several years ago the Corporation came to the conclusion that it should develop and produce a training system on their own. Frolov thinks that only this approach allows the creation of the training systems to reflect the 100% real fighter experience being able to improve the simulators in time and along with aircraft upgrades. According to MiG designers, only their mathematic models acquired the necessary high precision needed to enable corrections according to the information obtained throughout the aircraft life cycle.

The program of technical aids announced for export by RAC MiG in 2003 includes an interactive computer-based training system (ICTS) and a full-mission simulator. These systems allow customers to fully realize all the stages of pilot's training right through from theory to high readiness for the real combat situation.

ICTS is a set of computer-based classes, automated working places and relatively simple simulators enabling pilots and crew to perfect different missions (so-called procedures). The system allows for training of both pilots and ground personnel. The ICTS core is a reloaded training program library and a training process control system. ICTS designers stress that the system can employ mobile terminals to find and improve technical failures on-board the aircraft. It could be, in particular, a failure of electronic catalogues and manuals, technology charts as well as three-dimension models of the aircraft and its main parts. ICTS allows for the individual condition and failures statistics to be completed on each aircraft to



improve the service system.

The full-mission simulator fulfills over 90% of the training tasks required of a regular combat pilot training course including such difficult ones as enemy air defense penetration, long-distance and dog-fight, ground and sea-surface strikes, combat operations in a group formations, as well as solving different system failures. The pilot being trained can work with not just an instructor, but also other pilots, while the simulators can be combined in the network to mock-up various group actions.

To complete its full-mission simulators MiG offers different multi-channel visualization systems from relatively simple systems based on the computer screens up to complex and relatively expensive laser-based AVIOR systems developed by Rheinmetall defence electronics (Germany).

The latest simulator has been integrated with the special moving system to give the pilot a "flight impression". MiG designers claim to make MiG-29K/KUB simulators with moving systems at the request of the Indian Navy to train the aircraft carrier pilots in a best possible way.



MiG simulators can be adapted according to the local peculiarities including landscape and the special type of equipment and weaponry. The next step in the adaptation process is to input information to fulfill mission planning and real combat task training. The ICTS allows the storage of individual records of the pilots and ground personnel through their complete service history.

Recently MiG has been delivering ICTS for various types of MiG-29s but it is able to offer its customers simulators for other types of MiGs.

According to MiG export records the ICTS employment decrease the costs of the pilot training by 25-30% and cuts the time for training by half. •



# Exciting Times

India and its neighbours hold the key to the rapidly growing business aviation market that is taking the world by storm



As chairman of Raytheon Aircraft Company (RAC), Jim Schuster is the architect of the US \$3.3 billion deal that will see Schuster becoming chief executive of the new Hawker Beechcraft Corporation. This is one of the biggest deals in the business aviation sector. Schuster is confident that the strategy that has made RAC successful, will now see further growth – thanks primarily to the new markets of India and the Middle East.

## Looking East

Schuster explained just why so many of the primarily US-based manufacturers are turning their attentions eastwards. He pointed out that “the percentage of sales outside of the traditional North American market is at about 40% now but across the industry you’ll see a balance of 50%.” The quid pro quo as far as the developing markets are concerned will be greater presence in the market place. Encourag-

ing US manufacturers to create facilities away from the North American continent has proved to be impossible in the past, but now Schuster sees possibilities ahead. On competitiveness, he said, “In order to remain cost competitive we will continue to evaluate what we make where we make it, what we buy where we buy it. And we’ll keep tweaking that to make certain we keep cost structure in line.”

## New Horizons

The Hawker Beechcraft Corpn will be looking for investment to increase the product line – which already includes the world’s best selling business jet the Hawker 800. Schuster said, “we have six clear drivers. Being cost competitive remains very important. We need to deliver highest quality products in the industry and put a stronger emphasis on support and customer services.” Schuster stressed the need to introduce new products into the market. •

## In Brief ...

### Indian space programme achieves enviable milestones

The Indian space programme has achieved a strong and long list of successes. Within the constraints of column space, we recount a few of them here:

- Successful ground testing of the indigenous cryogenic stage for GSLV; good progress made in the GSLV-Mk III project and demonstration of Supersonic Combustion Ramjet (Scramjet).
- Winning of two contracts for building communications satellites for European customers jointly with EADS, France.
- Chandrayaan-1 mission made substantial progress and ISRO agreed to carry two US-NASA instruments on board the spacecraft in addition to its own five primary instruments and three instruments of European Space Agency and one from Bulgaria.
- The Indian Government approved the establishment of Indian Regional Navigational Satellite System with a constellation of seven satellites to be realised over 6-7 years to provide navigation and timing services over the Indian subcontinent.
- The EDISAT network has expanded to 33 nodes connecting about 10,000 classrooms.

## Flocking to India

Many manufacturers see India as vital to their plans and will be at Aero India in Bangalore to make their respective cases. According to Judith Moreton, MD of **Bombardier's** Skyjet International, the growth in the market will be evolutionary rather than revolutionary. Producing business jets range from the Learjet light jet aircraft to the ultra long range Global Express XRS that can fly some 6,500nm. Bombardier has invested heavily in its charter operation business. Skyjet offers a jet card system that allows customers to buy the use of as little of 25 hours of a business jet a year. Bombardier has also recently introduced the Learjet 60XR.

**Gulfstream** sees the whole Asian market as a stronghold with its flagship G550. With some 50% of all business jets operating in the Middle East for example, the Savannah based company recognises the need to increase awareness of the benefits of business aviation so that the potential clients see the advantages as more than just status.

**Cessna** is growing its product line and has announced two new aircraft – a Citation CJ4 and the upgraded Citation XLS+. The biggest competition is for lighter jets like Cessna's Mustang which is described as an entry-level business jet; but the market has been shaken up with the introduction of the **Eclipse** 500 and the Adam Aircraft 700. Eclipse 500 is the brainchild of former Microsoft executive Vern Raburn who was backed by his former partner Bill Gates in developing this four seater.

But it is at the luxury end of the market that the business aviation world will be focusing its attention this year. The French manufacturer **Dassault** is set to deliver the Dassault Falcon 7X which can fly at Mach 0.92.



# Trusted Indian Partner



Patriot in action

**T**he Raytheon team led by Walter F Doran, President of Raytheon Asia, talked about his company's global leadership in technology-driven solutions during an interactive session with a team from SP Guide Publications. He said that Raytheon provides customers with integrated mission systems. The company is an industry leader in defence and government electronics, space, information technology, technical services, business aviation and special mission aircraft. Raytheon provides integrated mission systems to meet the critical defence and non-defence needs of its customers, he said. The company has 8,000 programmes and 13,000 active contracts. It had a sale of US \$21.9 billion in 2005.

## Strategic Business Areas

It has the following four major business areas:

**Missile Defence:** It includes sensors, interceptors, command and control, and systems integration.

**Intelligence, Surveillance and Reconnaissance:** This enables information dominance.

**Precision Engagement:** Aids in shortening the sensor-to-shooter timeline.

**Homeland Security:** Provides solution for a safer world.

Raytheon has been a trusted Indian partner for more than 60 years which includes:

- Raytheon Beechcraft & Hawker aircraft
- Air Traffic Management Systems in Mumbai & New Delhi
- ISRO partnership to implement GAGAN (GPS and Geosynchronous Augmentation system)
- Sensors for India's first lunar-orbiting satellite, Chandrayaan-1
- Firefinder hostile artillery detection radar system for Indian Army
- Paveway laser guided bomb kits for Indian Air Force

Raytheon offers to India the following:

### Military Systems

- Air dominance by integrated fighter aircraft with weapons like AGM-65 Maverick, AIM
- 9M Sidewinder and active electronically scanned array (AESA) radar, among others. Raytheon's advanced systems currently equip many leading fighter platforms in-

## Raytheon awarded subcontract for Sea-Based X-Band Radar sustainment support

Raytheon Company has been awarded a US \$32.7 million subcontract to provide sustainment support for the X-Band Radar (XBR) portion of the Sea-Based X-Band Radar (SBX). The award was made by Boeing Integrated Defense Systems, the prime contractor for the Ground Based Midcourse Defense (GMD) element of the Ballistic Missile Defense System (BMDS). SBX is a component of GMD. As a primary sensor for the BMDS, the XBR performs the critical functions of cued acquisition, target tracking, discrimination and engagement hit assessment.

## Crystal Gazing India's meteoric rise into top aerospace destination

India is rapidly developing into a major player in the world aerospace industry. So believes EADS, a global leader in aerospace, defence and related services. Several Indian companies have been contributing for over 40 years to the global success of EADS, believes EADS CEO Tom Enders. Reciprocating this support, EADS has declared its commitment to partner India in the development of both its aerospace infrastructure and its industrial capabilities in aviation, space and defence technology.

This was announced by Enders during meetings in New Delhi with Indian top officials. EADS India Private Limited, a 100% owned subsidiary of EADS, was registered earlier this year and will lead the development efforts in India. A significant step will be the opening of the EADS Technology Centre in India which is likely to be ready in early 2008. This campus-style institution will bring both the EADS subsidiaries and the Indian partners under the same roof, performing engineering and information technology services. Central to the EADS campus will be a state-of-the-art engineering unit called the Engineering Centre Airbus India. It will be a 100% owned subsidiary of Airbus and will represent the biggest on-site unit owned by an EADS Division. The EADS Technology Centre India will become a major employer in the aerospace and defence sector in India with the potential to create up to 2,000 jobs. Over the next 15 years, the volume of investment and high-tech activities generated by the Technology Centre, including the Airbus Engineering Centre and other cooperation programmes will peak at Rs 11,000 crores (Euros 2 billion).

cluding F/A-18, F-15, F-16, F-22 and JSF F-35.

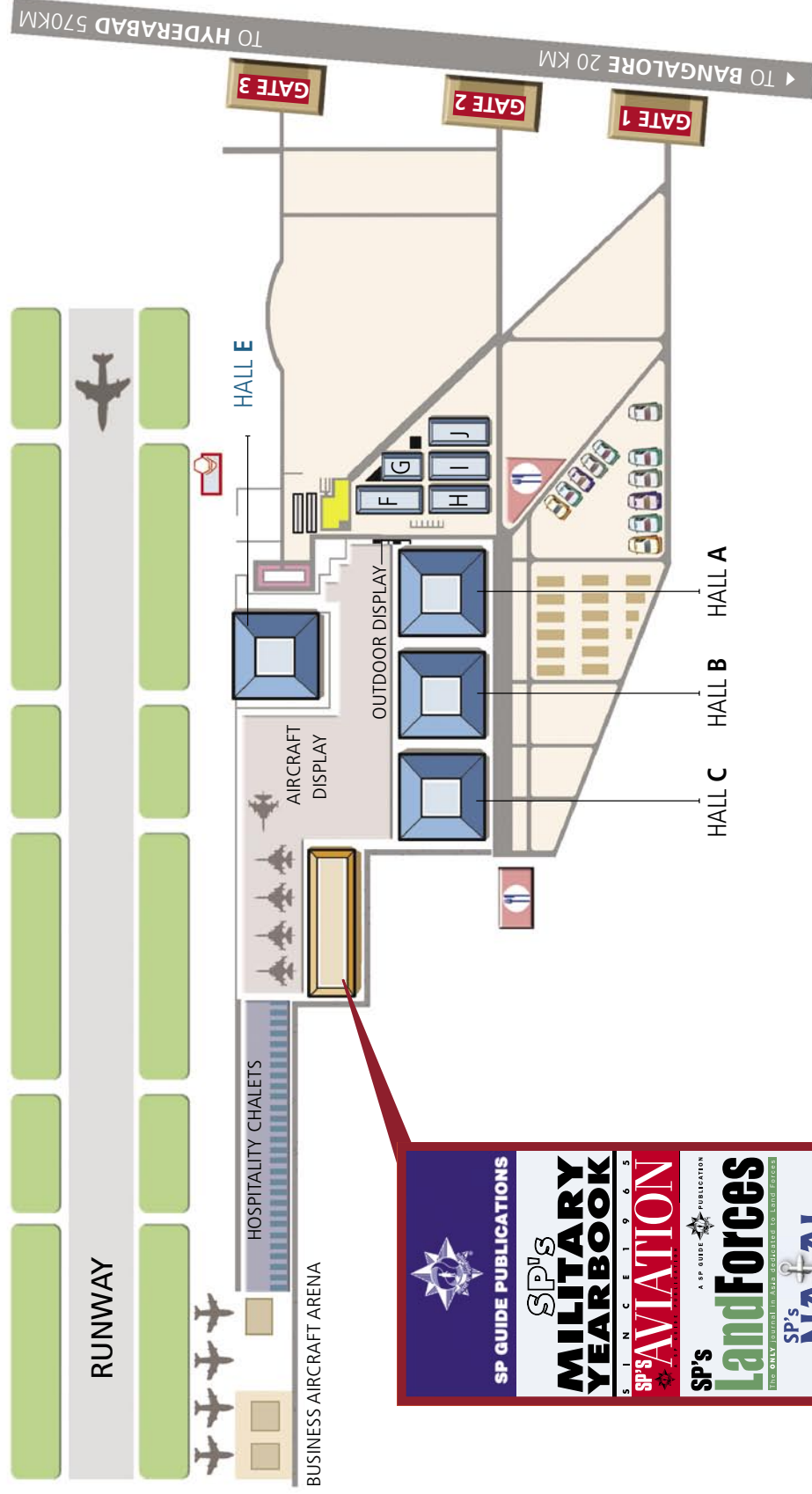
- Anti-Missile Defense with Patriot, surface launched AMRAAM and Standard Missile
- Naval mission systems integration
- Command, Control, Computers and Intelligence (C3I) systems to include satellite communications, tactical and civil communications, modular/mobile command and control and data networking systems.

### Civil Systems

Integrated Airport Security Systems for airports and Air Traffic Management Systems •



# AERO INDIA 2007



SP GUIDE PUBLICATIONS

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**HALL D**

**BOOTH 1.5, 1.6 & 1.7**

# A to Z of Exhibitors

Exhibitor Name	Hall No.	Stall No.
3 D Contech	A	4.7 (a)
A S Popov Communication	A	2.5
A.D.R. S.a.s	B	4.3
Accord Software & Systems	B	3.3
Accurex Solutions	H	1.3
Acra Control	B	2.12
Action Aviation	J	2.5 (a)
Acutronic AG	B	1.9
ADPR Consult Sdn Bhd.	G	3.1
Advance Tech. Controls	E	5.13
Aerea	C	3.1
Aerial Services	H	2.3
Aero Maoz	A	5.2
Aeromedia Publishing House	B	3.4
Aeropriobor - Voskhod JS	A	2.2 & 2.3
Aerostaff Australia	C	5.1
Aerostar SA	C	1.1
Aerotechnica Corporation	B	2.11
AFSY	A1	6
Agarwal Rubber	F	35
Agusta Westland	C	3.4
AIAD And MOD Italy	C	1.1
AIR LIQUIDE	B	4.3
Air New Zealand Airline Training	J	3.1
Alenia Aeronautica SpA	C	3.4
ALKAN	B	3.13
Allied International Corporation	J	2.2
Alpha Design Technologies	B	3.5
Altair Engineering India	I	1.1
AM General LLC	Outdoor	7
Amado Tools	F	10
Ampex Data Systems Coporation	J	3.3
Amphenol Interconnect India	C	1.2&1.3
Ankit Forgings	F	31
ANTAVIA	B	4.2 (d)
Apollo Computing Lab	I	3.1
Apollo Metal	C	4.11
Arianespace	F	2
Army Aviation	D	2.4 ( c )
Arrow Aviation Services	I	3.3
Artisys s.r.o	A1	1
ASE SpA	C	3.3
Asian Military Review	I	1.7
Astra Microwave Products	H	1.1
AT Czech s.r.o	A1	1
ATR	B	2.7
Augen Technologies Software Solutions	I	1.2

Exhibitor Name	Hall No.	Stall No.
Australian Trade Commission	C	5.1 (d)
Autotec Systems	D	1.3
Avasarala Technologies	A1	3
Avdel Aerospace	F	26
Aviaavtomatika Design Bureau "Pribor" JSC "	A	2.2 & 2.3
Aviaexport P & C	A	2.5
Aviation Australia	C	5.1
Aviation Gearboxes and Transmissions - Perm Motors ( OJSC Reductor - PM)	A	2.5
Aviation Industry Group	C	4.8 (f)
Aviation Week & Space Technology	E	5.1
Aviazapchast PLC	A	2.2 & 2.3
Avimarine (Australia)	E	3.11
Avi-Oil	F	25
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BACHMANN SAS	Outdoor	3 (a)
BAE Systems	C	4.6, Out Door 11, Chalet 13
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BDL Iev German Aerospace Industries Association	A	4.6 ( b - 1)
Bell Helicopter Textron	E	2.8-2.11 & 2.6
Bengal Waterproof	A1	7
Bharat Dynamics	C	3.9
Bharat Earth Movers	G	2.2
Bharat Electronics	D	2.6, 1.17 - 1.19, 1.20 - 2.8, 3.21 - 3.24, Chalet 11 & 12
Bharat Rakshak	I	3.12
Bijal Petroleum Equipment Corporation	B	3.1
Bney Meir	A	5.9
Boeing	E	2.5 / Chalet 29-32
Bombardier	E	4.3 / BAA 1 & 2
BrahMos Aerospace	E	2.4 (b)
Bumar Sp. Zoo	A1	16
Business & Commercial Aviation	E	5.1

Exhibitor Name	Hall No.	Stall No.
Business Intelligence Services	E	5.1
Butler Technical Services	E	1.6
C Gear Australia	C	5.1
CADES Digitech	C	2.5
Capgemini Consulting	H	3.5
Captronic	G	1.1 & 1.2
CENAERO	I	2.1( b)
Cessna Aircraft Company	E	2.8-2.11 & 2.6
CFM International	B	2.3
Chanakya Aerospace Defence & Maritime Review	C	1.4
Chelton	C	4.8K
Chernyshev jsc	A	2.4 / Chalet 37
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CIRA Scpa - Italian Aerospace Research Centre	C	4.1
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CM Envirosystems	H	1.6
CNR Trade Fairs	A1	13
Cobham Air Refuelling & Auxiliary Mission Equipment Division	C	4.8K
Cobham Defence Communications	C	4.8K
Cobham plc	C	4.8K
ComAvia Systems Technologies	F	29
Commercial & Business Aviation Service	I	3.1
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Connekt Electronics	F	19
Controp Precision Technologies	A	4.2 (b)
Coral Digital Technologies	H	3.1
Corbus (India)	A1	8
CSM Software	D	2.2
Czech Invest (the National Investment and Business Development Agency of the Czech Republic)	A1	1
Czech Trade (The National Czech Trade Promotion Agency)	A1	1
Dassault Aviation	B	4.5



Exhibitor Name	Hall No.	Stall No.
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Dean Wilson Aviation	C	5.1
Deccan Aviation	I	3.4 - 3.7
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Development Organisation		to 3.15
& Aeronautical		Chalet
Development Agency		7-8
Defense News Media	E	5.12
Group		
Defense Technology Intl	E	5.1
Defenseworld.net	G	3.7
Degussa	A	4.11(a)
Department of Strategy	A1	1
and Quality of Services		
DESO	C	4.8 (m)
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& Relays		
Diamond Aircraft	G	1.4-1.7
Diehl BGT Defence	A	4.11
Directorate General of	D	2.4 (b)
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Assurance		
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EDS Technologies	H	3.11
Eduard Wille	B	1.14
EIS Electronics	A	4.7 (a)
Elastomeric Engineers &	F	24
Aerospace Engineers		
Elbit Systems	A	4.3, 5.5 &
		5.7
Elcus Electronic Company	A	2.2 & 2.3
Eldis Pardubice s.r.o	A1	1
Electron Beam Processes	C	4.8 (f)
Electrosignal Novosibirsk	A	2.5
Elektronik Lab	J	3.9
Elettronica	C	3.6
Elettronica Aster SpA	C	4.2
Elisra Group	A	4.3 (a)
Embraer	E	2.4 (a)

Exhibitor Name	Hall No.	Stall No.
Engine Alliance	E	1.8 - 1.11
Enstrom Helicopter Corpn	J	1.5
EPICOS	C	1.9
ESCO Turbine	I	2.1 (e)
Technologies		
ESL Defence	C	5.8
Esterline Corpn	C	4.8 (L)
Esterline Sensors Group	C	4.8 (L)
ETPS - Qinetiq	C	4.8 (d)
EUREP Industries	B	4.3
Euro Avionics Navigation	B	2.1
Systems		
Eurofighter	C	4.6 (a) /
		Chalet
		36
Eurotrop	C	1.13
Exhibition Indian	J	1.9
e-Xstream Engineering	I	2.1 (d)
Farnborough Aerospace	C	4.8 (f)
Consortium		
Faro Business Technology	I	3.13
FGUP NPP Polyot" "	A	2.5
FIDAE 2008	J	3.13
Filtronic Components	C	1.12
Finmeccanica	C	3.4
Flash Forge	C	2.3 (b)
FORCE	I	1.9
Foresight Solutions	I	3.9 Chatel
		: 34
Forges De Bologna/manoir	B	4.1(a)
Industries		
Forges De Zeeburgge	I	2.1 (g)
FormTech	A	4.7 (a)
French MoD - DGA	B	3.1
FSUE MMBPE "Salut" "	A	1.4
G.D. TECH	I	2.1 (I)
Galileo Avionica	C	3.4
GE Aviation	E	2.4(d)
		Chalet 28
GE India Industrial; Div:	A1	5
GE Sensing		
Gem Engineering Inds	I	1.5 & 1.6
Genser Aerospace &	I	1.12 &
Information Technologies		1.13
GIFAS	B	4.3
Gippsland Aeronautics	C	5.1
GKN Aerospace	C	4.8 (j)
Gripen International	Outdoor	7
Gulf Aviation Guide /	E	5.11
Media One Group		
H R Smith Group of	C	4.8 (g)
Companies		
Hale Hamilton (Valves)	C	3.11
Hampson Aerospace	C	1.11
Handtmann A-Punkt	C	3.7
Automation		

Exhibitor Name	Hall No.	Stall No.
Hanse-Aerospace	A	4.7 (a)
Hanse-Aerospace	A	4.7 (a)
Wirtschaftsdienst		
Hardigg Europe	C	4.8 (f)
HBL Power Systems	B	2.2
HCL Technologies	I	2.4
Heinkel Engineering	A	4.7 (a)
Hentzen Coatings Inc	J	2.2
Hical Technologies	A1	2
HIGHTEMP Furnaces	G	2.3 (b)
HIGHTEMP VAC AERO	G	2.3 (b)
Hindustan Aeronautics	E	3.1 - 3.4,
		3.5 - 3.6,
		4.1 - 4.2,
		5.2 - 5.6
		/ Chalet
		4 - 6
Hindustan College of	H	1.4
Engineering (TIFAC-		
CORE)		
Hindustan Electro	F	12
Technology		
Hindustan Institute of	H	1.4
Engineering Technology		
Honeywell Aerospace	J	2.4
Horizon International	J	3.13 (a)
Flight Academy, UAE		
Hutchison	B	4.1 (b)
Hydrautest	B	1.6
Hynetic Electronics	H	3.13 (a)
Hypercoat. Bombay	H	3.3
IAF	D & E	2.4 (a) /
		2.1
IAI -Israel Aerospace Ind	A	4.2
Ibilt Technologies	J	3.11
Icomm Tele .	A1	14
ILA 2008 Berlin Air Show /	A	4.6 (b - 2)
MESSE Berlin		
Imperial Defence Services	H	2.2
Indamer Company	H	2.3
India Strategic	D	1.11
Indian Aviation - Civil	G	3.2
Military		
Indian Defence Review	B	1.15
Indian Defence Yearbook	B	3.8 (a)
Indian Space Research	F	1
Organisation (ISRO)		
Indo German Chamber of	A	4.9
Commerce		
Indo Russian Aviation	C	2.4
Indra	C	1.14
Indus Aviation	A1	11
Indus Teqsite	B	2.3 (a)
Industrial Metals	J	2.2
International		

# A to Z of Exhibitors

Exhibitor Name	Hall No.	Stall No.
Industry Capability Network (Victoria)	C	5.1
Infospectrum India	Outdoor	3b
Infotech Enterprises	B	3.8
Innovint Aircraft Interior	A	4.7 (a)
In-services Middle East	B	4.3
Integrated Digital Systems	G	3.3
Inter Vestnik (Airfleet)	J	3.8
International Aerospace (SAP Media)	D	1.1
International Aerospace Engines	C	5.5-5.6
Intertechnique	B	4.2 (b)
Interturbine Logistik	A	4.6 ( b - 6)
Irkut Corporation	A	1.1 / Chalet 22
Israel Military Industries	A	4.4
ITT	C	3.11 (a)
J. S Precisions	G	2.3 (d)
J. V. Electronics	H	1.12
Jane's Information Group	C	4.9
JENA-OPTRONIK	A	4.6 (b - 2)
JET TURBINE SERVICES	C	5.1
Joint Stock Company - Plant for Electric Connectors (ISET)	A	2.2 & 2.3
Joint Stock Company - Ufa Engine Industrial Association “	A	2.2 & 2.3
JSC Tantal” “	A	2.2 & 2.3
JSC Aircraft Component Sourcing Company (MFG)	A	4.6a
JSC ARC Konversia	A	4.6a
JSC OPK Oboronprom	A	2.2 & 2.3
K.G.C. College of Technology	H	1.4
Kalapurna Steel & Engg.	D	3.1
Kamov Company	A	2.2 & 2.3
Karl Storz Endoscopy (I)	D	1.13
Karnataka Hybrid Micro Devices	F	28
KAZAN HELICOPTERS	A	2.2 & 2.3
Kedah Electronic Tech	H	1.5
Kilgore Flares Company	J	1.7
Kineco	A1	4
Kingsly Instrumentation and Communication	D	2.3
Kirkhill TA Company	C	4.8 (L)
Klimov Company	A	2.2 & 2.3
Kongsberg	B	2.1
Korry Electronics	C	4.8 (f)
Krasnyoctiabr OJSC	A	2.4
Kumaran Industries	F	23
L3 Communications	J	1.1
Lapp India	A	4.1

Exhibitor Name	Hall No.	Stall No.
Laversab India	H	1.8
Leach International Europe	C	4.8 (L)
Lockheed Martin	E	4.4 / Chalet 10
Lucas - TVS	F	32
Lufthansa Technik AG	A	4.8
M S Ramaiah School of Advance Studies	F	6
M.P.I Prague CZ	A1	1
MACH AERO	B	4.2 ( c )
Macmet Technologies	F	16
Mahindra Engineering	I	1.11
MAINI GROUP	I	2.4 (a), OD - 3
Mak Controls & Systems	F	22
Martin Baker Aircraft	C	4.8 (h)
MATCON	H	2.4 (a)
Mayaurakshi Equipments	F	3
MBDA	C	4.5
MD Helicopters	J	2.5 (a)
MEL Systems And Services	F	9
Meltronics Systemtech	H	1.11
Meridian Inflatables	H	3.2
Merlinhawk Associates	H	2.4
Messier Services	B	4.4
Messier-Dowty	B	4.4
Metacomp Technologies	J	2.2
Metallic Bellows (India)	F	36
Metallizing Equipment	A1	15
Metris	J	1.13
Microturbo	B	4.4
MiG Russian Aircraft Corporation	A	1.2 / Chalet 20-21
MIL Moscow Helicopter Plant , JSC	A	2.2 & 2.3
Military Parade	J	1.6
Ministry of Industry and Trade of the Czech Republic	A1	1
Mishra Dhatu Nigam	E	4.3a
Moog Aircraft Group	E	3.12
Moravan - Aeroplanes a.s.	A1	1
Motor Sich	B	3.9 (c)
MOTOROSTROITEL JSC	A	2.5
MST Matzen Schlauch-Technik	A	4.7 (a)
Natchu Security Systems	H	1.9
Natesans Antiqarts	H	3.13
National Aerospace Lab	H	2.5
NEXTER (Giat Industries)	B	4.1( c )
Nivisys Industries LLC	J	2.2
Noble Enterprises	A1	9

Exhibitor Name	Hall No.	Stall No.
Northrop Grumman	E	3.7
NOVINTEC SA	B	4.3
Ocean Air INC	J	2.2
Omniscient Electronics	A1	13 (b)
ONERA	B	4.2 (e)
Onward Technologies	B	1.5
Open Engineering	I	2.1 (h)
ORBIT Technology Group	A	4.2 (a)
Ordnance Factory Board	G	2.1
Orient Flight School	H	1.4
Overhaul & Maintenance	E	5.1
Park Controls and Communications	H	2.1
PAULSTRA	B	4.3
Pawan Hans Helicopters	D	1.15
PBS Velka Bites, a.s.	A1	1
PCI	G	1.4
Perm Motors Group	A	2.5
PGA AVIONICS	B	4.3
Phozotron-NIIR Corporation JSC	A	1.2
Plexion Technologies	I	1.11
Polish Chamber of National Defence Manufacturers	A	5.1
PowerJet	B	4.4
PPG Aerospace	C	4.8 (a)
Pratt & Whitney	E	3.8 / Chalet 33
Prime Aerospace Singapore & UAE	B	1.6
Processware Systems	B	3.2
Prodera	B	2.12
Pulse e Technologies	D	1.14
Qineti Q	C	4.8 (e)
Queensland Goverment	C	5.1(b)
Quest	C	2.1
Rada Electronic Industries	A	5.4
Radmor S.a.	A	5.1
RAFAEL	A	4.5
Rafale International	B	4.1
Rafi GB	C	4.8 (f)
Ramenskoye Design	A	2.2 & 2.3
Raytheon Company	E	3.9
RDI Communications	C	3.10 (a)
Realisim Technologies	I	2.5
RealTime TechSolutions	I	1.8
Revue Thommen AG	C	1.8
RFD Beaufort	C	4.12
RMIT University	C	5.1
Rohde & Schwarz	E	5.8
Rolls Royce Plc	C	5.3 - 5.4 Chalet 15



Exhibitor Name	Hall No.	Stall No.
Rosler Oberflächentechnik	A	4.14
Rosoboronexport State Corpn	A	2.2 & 2.3 Chalet 17
Rostvertol PLC	A	2.2 & 2.3
RSL Electronics	A	5.1
Ruag Aerospace Service	A	4.6 (b - 5)
Russian Aviation	A	2.2 & 2.3
S. M. Creative Electronics	E	1.5
SAAB AB	Outdoor	10
SAARC Tool Tech	D	1.16
Sabena Flight Academy N.V.	A	5.11
SAFRAN	B	4.4 Chalet 24-25
SAFT	B	4.2 (f)
Sagem Défense Sécurité	B	4.4
SAMTECH	I	2.1
Samtel Color	E	1.1
Sanghvi Aerospace	F	11
Sankhya Infotech	I	1.1
Satyam Computer Services	I	2.3
SBAC	C	4.8
SCHENKER AEROPARTS	D	1.8
Scope Metal Trading	E	5.7
SE IVCHENKO-PROGRESS	B	3.9 (b)
Seabira Aviation Australia	C	5.1
SECAPEM	B	4.3
Sekai Electronics	E	1.12
Selex Communications	C	3.4
Selex Sistemi Integrati	C	3.4
SENSOREX	B	4.2 (g)
Servocontrols & Hydraulics	G	3.6
Shakti Enterprises	H	1.1
Shashi Kaizen Industries	F	27
SHOW NEWS	E	5.1
SIBAT - Israel M.O.D.	A	4.4 (a)
Siemens	C	2.3 (a)
Sigma Electro Systems	D	1.1
SIGMA MICRO SYSTEMS	D	1.12 / Chalet 23
Signature Industries/ Sarbe	E	4.5
Sikorsky Aircraft	J	2.5
Silver Software	H	3.4
Sino Swearingen	J	2.5 (a)
Sitec Aerospace	A	4.6 (b-3)
SKF Aerospace	B	4.5 (a)
SLN Technologies	A1	15 (a)
Smith Aerospace	C	4.7

Exhibitor Name	Hall No.	Stall No.
Snapon Tools	I	2.2
Snecma	B	4.4
Snecma Services	B	4.4
Society of Indian Aerospace Technologies and Industries (SIATI)	F	30
SOFEMA	B	3.12
SOFRADIR	B	3.11
Sokol Nizhny Novgorod Aircraft Building Plant JSC		
Solelectron Centum Electronics	I	3.11
Souriau India	F	15
Southern Electronics	F	14
SP Guide Publications	D	1.5 - 1.7
Special Metals Services	G	3.5
Speck Systems	A	4.7
SpetsTechnoExport	B	3.9 (a)
State Research Institute of Aviation Systems	A	2.5
Stein Seal	C	4.8 (f)
Sterling Book House	G	1.3
Strongfield Technologies	C	5.9
Sukhoi Aviation	A	2.1 & 1.3 Chalet 18 - 19
Sukhoi Civil Aircraft	A	2.1 & 1.3
Sukhoi Design Bureau	A	2.1 & 1.3
Supersonic Services, INC	J	2.2
Systems Advisers Group	D	3.3
Systems Aids	F	7
Tadiran Communications	A	4.1
Taneja Aerospace & Aviation	H	3.12
Tata Consultancy Services	E	2.4 ( c )
Tata Technologies	D	3.2
TEAC Aerospace Technologies	J	3.12
Technocomplex Research and Production Center	A	2.2 & 2.3
Techspace Aero	B	4.4
TECHSPACE AERO	I	2.1 (f)
Tedopres Asia	J	3.2
Telecommunications Research Institute	A	5.1
Tellumat	C	3.10b
Tesscorn Systems	J	3.1
THALES	B	4.2
The Oriental Insurance Company	J	3.4
Titan	F	18
TITEFLEX EUROPE	B	4.2 (a)
TOCOL ENTERPRISES	F	33
Tool Tech Software	F	11
Touchwood Aviation	A1	13 (a)

Exhibitor Name	Hall No.	Stall No.
Trelleborg Sealing Solutions	C	3.8
Trident Infosol	B	2.4
Triveni Hi-Tech	F	13
Trusted Aerospace & Engg	J	2.3
TS Electronics	J	1.8
Tupolev PSC	A	2.5
Turbomeca	B	4.4
TW Metals	F	5
TWI	C	4.8 ( c )
Tyco Electronics	A	5.11 (a)
U.S. Department of Commerce	J	1.11
UGS India	G	3.4
UKTI	C	4.8 (b)
Ulbrich Stainless Steels & Speciality Metal	J	2.2
Ultra Electronics Electrics	C	4.8 (i)
UMAC AVIONICS	C	2.2
Unique Instruments & Mfrs.	F	4
United States Department of Defense (US DoD)	J	2.2
Ural Optical & Mechanical Plant (UOMZ)	A	2.2 & 2.3
US Airforce	J	3.5
Valeth High Tech Composites	F	21
Valtech .	C	4.1
Varisis Advanced Engineering & Software Technologies	B	1.1-1.4
Varman Aviation	A1	1
Varman Aviation	F	34
Vayu Aerospace Review	C	1.5
Vector State Corporation	B	3.9 (d)
VECTRA AVIATION	D	2.4 (d) / Chalet 27
VECTRA IT SOLUTIONS	D	2.4 (d)
Vem Technologies	H	3.7
VSMPO-AVISMA Corpn	J	1.1 & 1.4
VXL Technologies	F	20
Wallonia Foreign Trade & Investment Agency	I	2.1 (a) & ( c )
Wipro Technologies	Outdoor	5
World Aerospace Database	E	5.1
World Aerospace Sdn Bhd	E	5.10a
Ximax Automation	C	3.1
Yakovlev Design Bureau	A	1.1
Young India Films	I	1.3
ZEN TECHNOLOGIES	H	2.2
ZETATEK INDUSTRIES	B	1.8
Zone Aéronautique	B	4.4
ZVI a.s.	A1	1



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Freedom and democracy. They are the values we share. And the principles India's military forces are committed to defending, because freedom and democracy are won through dedication, service and sacrifice, and can never be taken for granted. As the world's premier defense company and the U.S. Government's leading information technology supplier, Lockheed Martin knows how important it is to stand strong with those who stand in defense of freedom and democracy. And it is why we are committed to working with India's military forces to meet India's defense and security requirements, now and into the future.