

# SHOW DAILY

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INTERNATIONAL AEROSPACE

## A Promise Delivered

“We have now delivered on our promise”. These were the words with which Singapore Prime Minister Lee Hsien Loong officially opened the inaugural Singapore Airshow 2008 on Tuesday.

And it was the timely preparation of a 82-million-Singapore dollar new site here which evoked such pride, after the Asian Aerospace show left for Hong Kong in 2006.

### Positive outlook

Lee also said that despite high fuel prices and the slowdown in the US economy presenting a stiff challenge for the aerospace industry, the long-term outlook looked positive. The Prime Minister said the signs are especially encouraging in Asia.



L - R Jimmy Lau, along with Ho Ching, wife of PM Lee, with Singapore Airport officials

“The region is expected to lead the growth in air travel, as the industry’s centre of gravity shifts to the East,” Lee

said. “With China and India integrating more closely into the global grid, demand for air

Contd. on page 02

## Dassault Falcon Opens Spares Centers in India & China

Dassault Falcon will be opening its Falcon spares distribution centre in Shanghai, China and has signed an agreement for spares distribution centre in Mumbai, India. The inventory is valued at nearly US\$2.2 million in Shanghai and US\$1.5 million in Mumbai and will be in place by the end of March and May respectively.

Once operational, Dassault Falcon will have approximately US\$8 million worth of Falcon spares in the Asia-Pacific region- nearly double the inventory in this region from one year ago. Shanghai and Mumbai will join a regional distribution centre in Singapore, where tooling for the Falcon 7X has recently been positioned, and a satellite distribution centre in Sydney, Australia.

According to Frank Youngkin, Vice President of Worldwide Spares for Dassault Falcon, “We have launched aggressive campaigns to increase service levels, lower prices, extend our spare parts warranty and end supplemental invoicing associated with the exchange transactions. We are now focusing on a dramatic reduction in delivery times.”

Similar to Singapore, the inventories in Shanghai and Mumbai will support the

Contd. on page 03

## Sikorsky X-2 Technology Update Offers Black Hawk Global Version



Stephen B. Estill

Stephen B. Estill, Vice President and Chief Marketing Officer, Sikorsky spoke to giving an update on the X2 technology programme and the recent MoU signing with Tatas for the S-92 cabins.

Currently the technology has already been ground tested and the company has taken a break from its testing to showcase the aircraft to the public at the HAI show in Houston next week.

“We would like to showcase the technology to the public since we have been talking about for 4-5 years. The helicopter will have the capacity to fly faster than 250 knots combined with the bundle of technology that we have been able to put together like the new rotor designs with low drag on the main rotor mast, fly-by-wire technology, all glass avionic cockpit, composite shell and blades in a fuel efficient with high power-to-weight ratio.”

He said that the full flight-

Contd. on page 02

With the first fly-by-wire helicopter flown in December last year, Sikorsky is certain and excited about its X2 technology.

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# A Promise Delivered...

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travel in the region will soar.”

Over 800 companies from 42 countries and regions, representing 59 of Forbes’ top 100 aerospace companies, are displaying their goods at the 30 hectare space.

## Singapore sings

Prime Minister Lee had some good news for Singapore, whose aviation output hit a high of \$ 4.9 billion U.S. in 2007, a growth of more than 10 percent over the previous year.

Up to \$355 million worth of investments are likely to be flagged off during the six-day show. *Contd. on page 03*

# Sikorsky X-2 Technology.....

Contd. from page 01

testing of the H-92, which has been incorporated with the X2 technology will be done in the second quarter this year. “We feel that the global markets need a fast and maneuverable helicopter in the light armed category, which is ideally suited for this helicopter.”

Sikorsky will initially introduce the helicopter in this category and already has three designs on the board with a small weapons suite configuration. “Although the helicopter is a new entrant in the market and might not be produced in time to compete for the light helicopter contracts in the region we would certainly like the customers to keep it in mind for the future.”

Speaking about the possibility of the technology being incorporated into the Black Hawks Estill replies that there are some variants of the X2 technology in the US Government programmes, but there no concrete plans to produce that programme into the Black Hawk currently.

However, the fly-by-wire technology which has been developed from BAE Systems flight management control systems is going to be incorporated onto four programs, which include the CH-53K for the US Marine Corps, the X2, the Canadian MH-92 (set for delivery in late 2009-2010) and the Black Hawk upgrade

programme where they will be introducing this technology onto the Hawks.

Estill feels that this technology will improve the helicopters efficiency and safety due to the reduction in the moving parts in the rotor as well as the workload of the pilot. “We are also working on a program called Sandblaster that will incorporate synthetic vision, which enables the pilot to land in a blacked-out or hostile environment.”

The company has now started marketing the international version of the Black Hawk, which will be a completely capable Black Hawk at an affordable price since we have been able to resource a lot of the components to lower cost manufacturers. “We have changed how we built the Black Hawk into a real commercial scenario. We have started taking orders for the same now and in these region countries that have shown interest include Korea, Philippines, Thailand, Middle-East and India.”

Talking about the MoU signed with Tata’s a few days back Estill said that the MoU is in the initial stages currently, it involves the manufacturing of composites and advanced materials as a second source for the S-92 fuselage. “The global demand for the S-92 has increased to a point that

we have taxed our existing supply, hence we needed a second source, which is why we have elected to work with Tata.”

The agreement not only involves delivering composite materials for the S-92 but also parts for the other international commercial as well as military products. The commercial value of the agreement is in excess of USD 800 million over a 7-8 year period added Estill.

Under the agreement Tata’s will produce fuselage, door structures, aircraft exterior skins and a combination of these products for Sikorsky. Although the finer details of the agreement have not been finalized, Sikorsky is looking at the fuselage for the S-92 to be delivered within a time period of 18 months. “However it is important that they meet the company standards and we are now working with Tata to establish the manufacturing and quality systems to meet our standards. Ideally within a time period of 18 months we would like to be able to export fuselages to our global distribution supply chain.”

“Sikorsky’s integrated product team that specializes in developing quality suppliers is already ready in the US to assist with the technical transfers. We will have a core team of engineers located

here to manufacture the tooling as per our specifications and concurrently the process managers will help Tata develop the metal and quality processes for the international environment.”

Currently there are no S-92 customers in the country but Estill hopes that after today’s developments the situation might change. “Generally we like to have access to the market that we have a supply chain from but that is not the reason of this agreement. We are bidding for the Air Force’s VIP Programme with the S-92 aircraft for the Prime Minister’s flying.”

The other VVIP officials that are already operating the S-92 in this version include the President of Korea, The King of Thailand, Emirate of Qatar and Kuwait, the Royal Saudi family, Prime Minister of Turkey, besides there are several fortune 100 companies who also use the S-92 for their VVIP travel.

Estill mentioned that Sikorsky is also considering opening a maintenance facility in partnership model India and a concrete decision on the same will be around the end of this year. “We will have a service center in the country so that the customers can service their commercial aircraft in the partnership model.”

# Pg No. 3

# Lockheed How

# between

# AD

# Glimpses of First day's Fly Past

Contd. from page 02



**Dazzling flying display**  
Shortly after Lee threw the doors open on the event came an exhilarating flying display. This was led by including one by the Black Knights, F-16 pilots from the Republic of Singapore Air Force.

The new team comprising 6 F-16 C Fighting Falcons donned the red and white

national colours as they went about their dazzling display. Crowds by the scenic green waters at the site were left enthralled as the fighters blitzed across the sky against robust music.

They were led by LTC Leng Wai Mun, a specialist pilot at HQ Tengah air base-with 23 years on the force. Among

their manoeuvres were the Delta Flyby, Twisted Loop, Vertical Twist, the amazing Flaming Heart and Curtains.

On roll after them were Royal Australian Air Force's Roulettes-flying six Pilatus PC 9s. Solo aerobatics by the F/A 18 & F 16 of the USAF, a T-50 of Korea Aerospace Industries and another swift

solo followed by Italy's trainer outfit Alenia Aermacchi-which fielded an M-346.

But the swansong came as the Airbus A380 rolled in-like a God from the skies. The huge mega-liner entranced the audience as it gracefully lit up the beautiful sky.

- Amitabh Joshi

## Dassault Falcon Opens.....

Contd. from page 01

current Falcon models based in the area with a main focus on the Falcon 2000, Falcon 900 families as well as the Falcon 7X. The Mumbai facility will be supplemented by the larger inventories held in Sin-

gapore and Shanghai.

The regional distribution centre in Shanghai will be managed by Aerospace Products International (API), while the distribution centre in Mumbai will be managed by

DHL. Through their bonded warehouse, DHL, in partnership with Team Aviation, will be responsible for the import/export, shipping receiving and transportation of Dassault Falcon Replacement parts.

DHL and Dassault has a long history of partnership. They provide shipping and customer service for Dassault's spares distribution centre in Le Bourget, France and other related services.

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# Pg No. 5 Honeywell AD

# CFM's Leap 56 Programme on Fast Track

**C**FM International, the 50/50 joint venture company between Snecma (SAFRAN Group) and General Electric Company's advanced technology acquisition programme, LEAP56 is on progress. The company completed component and rig tests in 2007 and many more are scheduled for 2008 and 2009.

"With LEAP56, we are focusing our efforts on engine architecture, advanced aerodynamics, materials, and environmental technologies to address the major challenges we see in the future," said Eric Bachelet, President and CEO of CFM. "The goals we have set are aggressive by any measure, but we are committed to validating and maturing the technology that will continue to meet our



*Eric Bachelet*

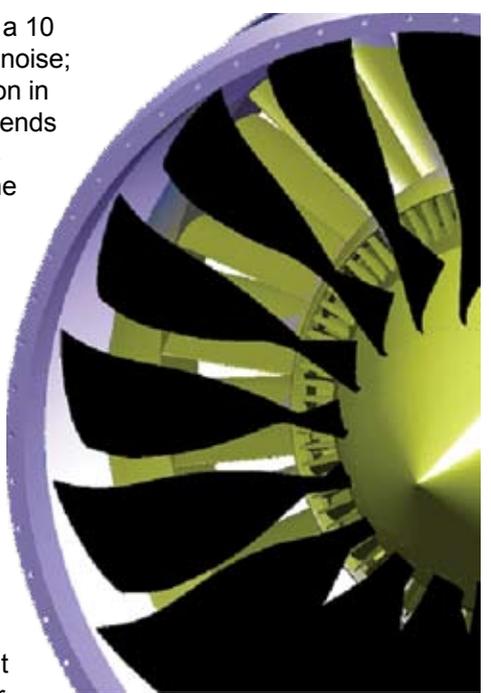
customers expectations over the long term." Compared to the current CFM56 Tech Insertion configuration, CFM is targeting 10 – 15 per cent lower specific fuel consumption; 15 percent lower maintenance costs; 25 percent

longer initial on-wing life; a 10 – 15 decibel reduction in noise; and a 60 percent reduction in NOx emissions. CFM intends to meet all of these goals without any sacrifice in the industry-leading CFM56 reliability standards.

The test schedule for 2008 includes a composite fan case containment test, along with fan aerodynamic and bird strike tests, TAPS combustor, and high-pressure compressor rig tests, in addition to high- and low-pressure turbine component tests. The company will also complete component tests on the resin transfer molding (RTM) fan blade and the ceramic matrix composite (CMC) high-pressure turbine nozzles.

The current LEAP56 configuration incorporates an RTM fan and composite fan case. The ultra-high pressure ratio core includes an eight-stage high-pressure compressor driven by a high-efficiency single-stage high-pressure turbine.

The core will incorporate third generation three dimensional aerodynamic design airfoils; the advanced TAPS II (Twin-Annular, Pre-Swirl) combustor; and advanced aerodynamics, materials, and cooling technology in the high-



pressure turbine. The highly efficient low-pressure turbine with reduced parts count will also incorporate advanced, low-weight materials such as titanium aluminide.

For the longer-term, CFM is also studying game-changing technologies that will address the ever-increasing requirements for lower noise and emissions. Using LEAP56 technology as the foundation, the company is actively pursuing counter-rotating fan technology, as well as opens rotor designs that build on the experience of the unducted fan from the late 1980s.



## ST Kinetics Showcases Eco-friendly Tow Tractors

**T**he land systems arm of Singapore Technologies Engineering Ltd, ST Kinetics is showcasing its hybrid electric airport baggage tow tractor HETT20 at the Singapore Airshow2008. The tractor incorporates the latest in hybrid electric technologies and is part of ST Kinetics' offering of green products designed to reduce the emission of greenhouse gases and increase fuel efficiency.

Singapore Airport Terminal Services (SATS) will be

the first customer to use the HETT20. SATS is the leading provider of integrated ground handling and airline catering services at Singapore Changi Airport.

The HETT20 incorporates a state-of-the-art diesel technology system that offers an improved fuel economy of up to 15per cent and zero emission in the 'electric (battery) mode. To improve the ease of operation the tractor has a built-in patent pending RFID system that switches its operation

between 'electric mode' and engine mode. Additionally, on board alternative power unit charges the battery on demand, eliminating the need for static charging or battery swapping.

According to Karmjit Singh, Chief Operating Officer, SATS, "we have been evaluating the benefits of introducing hybrid tractors at our baggage handling areas for sometime. The HETT20 fits our requirements in terms of functionality and performance. In addition, it reduces the consumption of

diesel fuel and is more fuel efficient compared with a conventional diesel tractor."

Says SEW Chee Jhuen, President, ST Kinetics, "SATS endorsement as our launch customer for the HETT20 amidst established industry players, represents our commitment to be socially responsible through the design of more environmentally friendly products.'

The HETT20 is on display at the show, at Airport Pavilion, booth 417.

# Pg No. 7 EADS CASA AD

# Lockheed Martin aims to Boost Sales in Asia-Pacific

Lockheed Martin had ambitious plans for the Asia-Pacific region. George Standridge, vice president for F-35 business development, has projected a production programme to sell approximately 500 of the stealth fighters to the Asia-Pacific region. Lockheed planned to focus on countries that are positioned to upgrade from models such as the F-16, F-18, or the Harrier.

Standridge disclosed that Lockheed Martin was in talks with four likely buyers, including Japan, South Korea, Australia, and Singapore for its F-35 aircraft. The F-35 Lightning II fighter has been described by the manufac-

turer as a multinational effort to build an affordable, supersonic stealth fighter, and is designed to replace a wide range of aircraft.

The sales target suggests revenue from the region exceeding US\$20 billion, as the U.S. government's initial orders were priced at US\$45 million per plane in 2002.

In a separate session, John Larson, vice president F-16 and T50, Lockheed Martin expressed strong confidence that India could be the largest defense market in Asia with US\$20 billion in possible air force, navy and communications contracts over the next decade.

"For Lockheed Martin, the



George Standridge

potential market in India is probably the largest in Asia Pacific," Larson said on the sidelines of the Singapore Airshow.

Lockheed Martin, the Pentagon's No.1 supplier by sales, announced earlier this month that it would sell six C-130J military transport planes worth about US\$1 billion to India. Larson said that India had taken an option to buy a further six of those aircraft.

Lockheed is bidding against Boeing Co and Russian and European rivals, for a potential US\$10.2 billion deal to sell the Indian air force 126 new multirole fighter aircraft. 

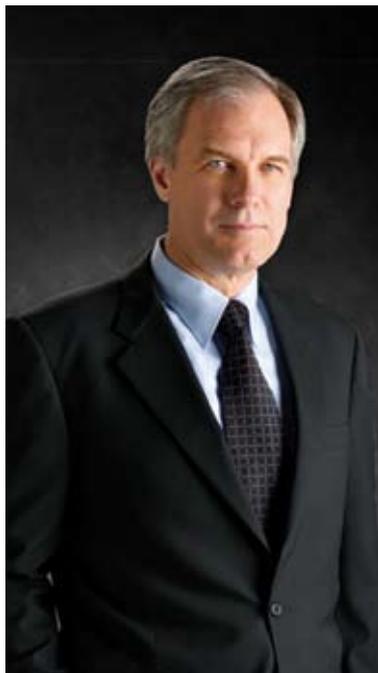
-Nazir Keshvani

# Honeywell Expands its Presence

With one of the widest portfolios in the industry, Honeywell is present from engines to avionics. Mark Howes, President, Asia-Pacific, Honeywell Aerospace spoke to Bhavya Desai on its wide presence in the aerospace industry.

Howes explains that the company has been doing business in the region for a number of years now, which has been predominantly driven by the airline, defence and business jets. However, there are several dimensions of change in this approach with aggressive movement in sourcing and manufacturing in this region, which has doubled this year and will continue to in the nature. "Some of the products that we plan to source out of the region include APUs, engines work, and mechanical suite on the A350 among others. So this is the intent of investment that we are looking at"

On the other hand we are also expanding our manufacturing footprint by looking at a three-fold increase in these operations and capac-



Mark Howes

ity. "We are also expanding our engineering capabilities, one of which includes domain knowledge present to support our outsourcing and sub-contracting and manufacturing expansions. But also engage our personnel with companies in the region in technical dialogue for joint-development programmes."

When asked about the focus on the participative and joint collaborative approach in the region Howes responds that the company is currently interacting and looking at a lot of possibilities under the numerous parameters and new parameters in the region. Focusing specifically on China, the company is in dialogue with the AVAC I and AVAC II, including the design bureaus. "We are also working with the leading avionics and mechanical system providers among others to explore new platforms as well as working on further developments. Besides China we are already working closely with other countries in the region like Australia, Korea and Japan to name a few."

The significance of the APAC region is clear when Howes states that the company will do a close billion dollar's business this year with majority of the share coming from activities surrounding the airline segment. This is closely followed by the defence space business, which is expected to build in time before the business

jet segment. "The business jet market is of particular interest due to the robust increase in the regional jet operators. We are making a lot of effort to ensure that our initial support structures are in place to support this growth as they start to proliferate in the region."

Sharing his views on the debate about the forecast on the turboprop versus regional jets Howes states that from what has taken place in the few years it is more economical to operate regional jets, which is the reason why they have seen an increase in demand. But in recent times due to the increase in the fuel price, which has led to substantial increase in the demand for the turboprop aircraft. "Interestingly AVEC I is also seen an interest in their MA 60 as well as the MA 70. But largely the choice depends upon the economic benefits as well as operating environment. However we think that the demand for turboprop aircraft will continue to grow in the coming years." 

# Abu Dhabi Airport's Third Terminal to be Commissioned in April 2008



**C**onstruction of a third terminal in Abu Dhabi International Airport is entering the final stages, with some of the facilities due to go operational this April. The remaining portions will come up in phases, and the terminal will become fully operational later this year.

“The new terminal will help improve the customer experience of ADIA and enhance the operational efficiency of airlines,” said H.E. Khalifa Al Mazrouei, Chairman of Abu Dhabi Airports Company (ADAC), the owner and operator of both Abu Dhabi and Al Ain International Airports.

The new 64,200 sqm terminal will offer passengers enhanced duty free choice and a range of restaurants and cafés. For premium passengers, it will feature new dedicated lounges and a concierge check-in facility.

The 5 million passenger facility will raise ADIA's capacity to 12 million passengers per year. Featuring eight gates, including two A380 compatible, the new terminal will meet the demand of Etihad Airways until the flagship Midfield Terminal Complex is ready in 2010.

ADAC is currently upgrading the existing runway from CAT II to CAT III, which will enable landing and take off at a visibility level of 50 metres. The upgrade work will be completed before the end of

2008.

Meanwhile, work on the second runway is progressing fast, with construction work almost complete. This CAT III runway will be able to handle the new generation of wide-bodied aircraft, including the Airbus A380. The dual-runway system will enable the airport to handle 70 take-offs/landings per hour.

## TRAFFIC GROWTH

Abu Dhabi International Airport has registered a record year in 2007, with a rise of 31 per cent in total passengers and 15 per cent in aircraft movements compared to 2006 to make it one of the fastest growing airports in the region.

The airport handled a total of 730,404 passengers in December 2007, a 40.4 per cent rise over the 520,133 passengers seen in December 2006. The number of aircraft movements increased 19.9% during the same period, rising from 6,517 in December 2006 to 7,811.

For the year 2007 (January-December), the number of total passengers increased by 31.0 per cent achieving a record 6.926 million passengers. Aircraft movements increased 15.0 per cent, having registered a total of 86,767 movements, compared to 75,437 in the same period in 2006.

Cargo volume continued its strong performance and increased to 28,184 tons in

December 2007 from 26,905 tons last year, a growth of 5% and for the full year 2007 cargo volumes increased 22% from 257,622 tons in 2006 to 315,317 tons.

A substantial factor in the Airport's strong growth has been the rapid expansion of its home base airline, Etihad Airways. In 2007, the national carrier of the United Arab Emirates expanded with 9 new destinations in 2007, increasing their number of average weekly services from 463 per week in January to 719 per week in December. Growth was also driven by a 10% increase in the number of other airlines operating at the airport with the commencement of services by Oman Air, Ethiopian Airlines and SAMA.

“It is very pleasing to see the continued expansion of our largest customer, Etihad Airways, and the commencement of so many airlines taking advantage of the quick and efficient services of the airport and the underlying economic growth of Abu Dhabi,” Al Mazrouei said.

“ADAC will continue to deliver on its commitment to the Government and the people of Abu Dhabi to provide world class customer service. Our plans for the future will deliver best in class facilities to ensure this airport is a fitting gateway for a world class city and the Emirate as a whole,” Al Mazrouei concluded.

## Significant United Kingdom Presence at Singapore Air Show

**T**he United Kingdom has one of the largest visiting national pavilions at the inaugural Singapore Air Show with a significant number of companies exhibiting within the Society of British Aerospace Companies (SBAC) UK pavilion.

The UK's official delegation is led by Tony Pawson, head of defence exports. He is accompanied by Keith Smith, regional director for Asia and Air vice-marshal Gavin Mackay who is the senior military adviser in Defence Export Services Organisation (DESO). DESO provides government assistance to both British Industry and its overseas customers.

“UK companies are very experienced in operating within South East Asia. They recognise the need for partnerships, long-term relationships, excellent post acquisition support and technology transfer,” said Pawson.

“British companies continue to be at the forefront of technological innovation and their ability to supply highly capable equipment at competitive prices has led to outstanding international success making the UK the second largest defence equipment supplier after the United States”, he added.

The Singapore Air Show gives UK companies the opportunity to develop these relationships and build new ones. The significant attendance by UK companies and military and civilian representatives reflects the importance of the relationship between UK and Southeast Asia especially in the areas of Defence.

- Nazir Keshvani

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**ENGINE ALLIANCE**  
**Fuel**  
**AD**

Pg No. 11  
**ENGINE ALLIANCE**  
**Fuel**  
**AD**

# E-2D Hawkeye Programme Well Underway



**W**ith the successful testing of the first prototype E-2D Hawkeye completed last year and the second prototype also in the testing programme, Northrop Grumman is very optimistic about the success of its new variant, which already has 75 firm orders from the US Navy.

Speaking exclusively to the *International Aerospace Show Daily* about the current status on the programme, Tom C. Trudell, Manager, International Business Development, AEW & BMC2 Programmes highlighted that both the prototype aircraft are currently in the vehicle and systems testing programme phase at the St. Augustine, Florida production facility of the company. "The test programme will continue until the end of the year and then head to the Naval Air Test Center to complete its final testing."

With the initial operational capability set to 2011, the company plans to roll out four aircraft a year for the US Navy. While on the outside the aircraft looks very much the same, it is the avionics system that has been given a complete facelift from the earlier version.

At the heart of the E-2D is the Lockheed Martin APY-9 radar system with an ADS-18 antenna, which rotates like the earlier Hawkeye radars offering electronically scanned phased array, allowing great versatility in beam-shaping and direction. The biggest advantage that the rotating antenna with its capability offers is that no matter, which way the aircraft is pointing the antenna provides optimum performance. Since positioning the aircraft correctly for the radar may not always be possible, depending on the scenario, this capability increases its versatility.

Bruce J. Wais, Programme Manager, Airborne Surveillance Radar, Lockheed Martin said that the APY-9 increases the aircraft capability to cover a wider spectrum and visibility over clutter.

The E-2D's nose has also been completely redesigned to fit in a co-pilot who can work as an operator. While the conventional instruments on the earlier version were fitted with analogue instruments, this has been replaced entirely by an electronic cockpit in the E-2D variant.

The aircraft features new glass cockpit, based on three 17-inch colour displays, one in front of each pilot and one between them. While both pilots are fully occupied during take-off and approach, one pilot is needed to fly the aircraft once it reaches its operational area. Consequently, the E-2D is configured so that the co-pilot can use his or her display as a tactical screen and act as a fourth mission system operator.

To cope with the extra weight of the new equipment, the E-2D has upgraded to the Rolls-Royce T56-A-427A engines.

When asked about the clearance on offering the E-2D

variant to the other countries John E. Beaulieu, U.S. Navy, PEO(T), EC/C2 FMS New Business Manager said that currently the programme is under review for export, which should conclude by the end of this year or early next year. There have been a lot of interest from many countries in the Hawkeye, but we can only engage with them once the clearance is obtained from the government.

Some of the countries that have shown keen interest include UAE, who has shown considerable interest and has issued a request for information India and Malaysia are also considered to be export prospects.

Speaking on the Indian issue he stated that there have been numerous dialogues between US and Indian counterparts as early as 2005, whereas the earlier version of the Hawkeye has already been cleared from exporting from the US Government.

Currently the aircraft is expected to come into operational capability in 2011 and deliveries to the US Navy might commence by 2009, which will go into service immediately. On the other hand should the export clearance from the Department of Defence come as early as this year end, the E-2D could be in the hands of an international customer by 2012 or 2013.

*-Bhavya Desai*

## Phase Two Upgrade of APR-39 Radar System

**N**orthrop bags US\$17m US Navy Deal  
Northrop Grumman announced that it has been selected by the U.S. Naval Aviation Systems Command for phase two of the APR-39 radar warning receiver (RWR) integration program for the Navy's CH-53K helicopter fleet. The radar warning receivers are electronic systems on-board the aircraft that essentially detect all radar signals, determine the

threat levels, and then command countermeasures.

Under the terms of the \$17 million contract, Northrop Grumman will incorporate all electronic warfare (EW) integration capabilities of the A (V) 2 and B (V) 2 versions of its APR-39 RWR now in production including EW controller and integration interfaces to multiple missile and laser warning sensors into the existing fleet of CH-53Ks. The phase two programme also

includes the integration of the APR-39 RWR with Northrop Grumman's Directional Infra-red Countermeasures (DIRCM) systems onboard each of the helicopters.

"The insertion of new, faster processors into the APR-39 in addition to the massive," said Greg Schmidt, vice president of Radio Frequency Combat and Information Systems programs at Northrop Grumman's Aerospace Systems Division. Memory

expansion will upgrade the system and allow programmers to keep up with threat developments,". "In addition, the integration of APR-39 and DIRCM will provide a State-of-the-art solution for war fighters looking to protect against electro-optical, infrared, radio frequency and electronic warfare threats."

The APR-39 B(V)X upgrade is scheduled for completion and flight testing in late 2009 or early 2010.

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AD

# Raytheon 'Paves-way' to Orders

**W**ith the Paveway having reached the milestone of booking orders in excess of US\$ 100 million in the APAC region, **Mark Borup, Raytheon Missile Systems Business Development Sr. Manager** spoke to *Bhavya Desai* about the Paveway missile at the Singapore Airshow. Excerpts:



Mark Borup

**The Paveway booked orders in excess of US\$ 100 million in the APAC region. Can you update us on the same?**

Raytheon is very excited about the opportunities that we see

in this region. The \$100 million in bookings shows that countries here understand and value the new technologies in precision-guided weapons

that Paveway brings to the floor. Paveway is answering the emerging requirements of air forces around the world. These bookings represent business in 5 countries that are long-standing customers of Raytheon Missile Systems. We hope to expand sales of Paveway to other regional customers in the near future.

**What are the options that these countries have ordered?**

These countries are already the existing customers of the company and their orders in-

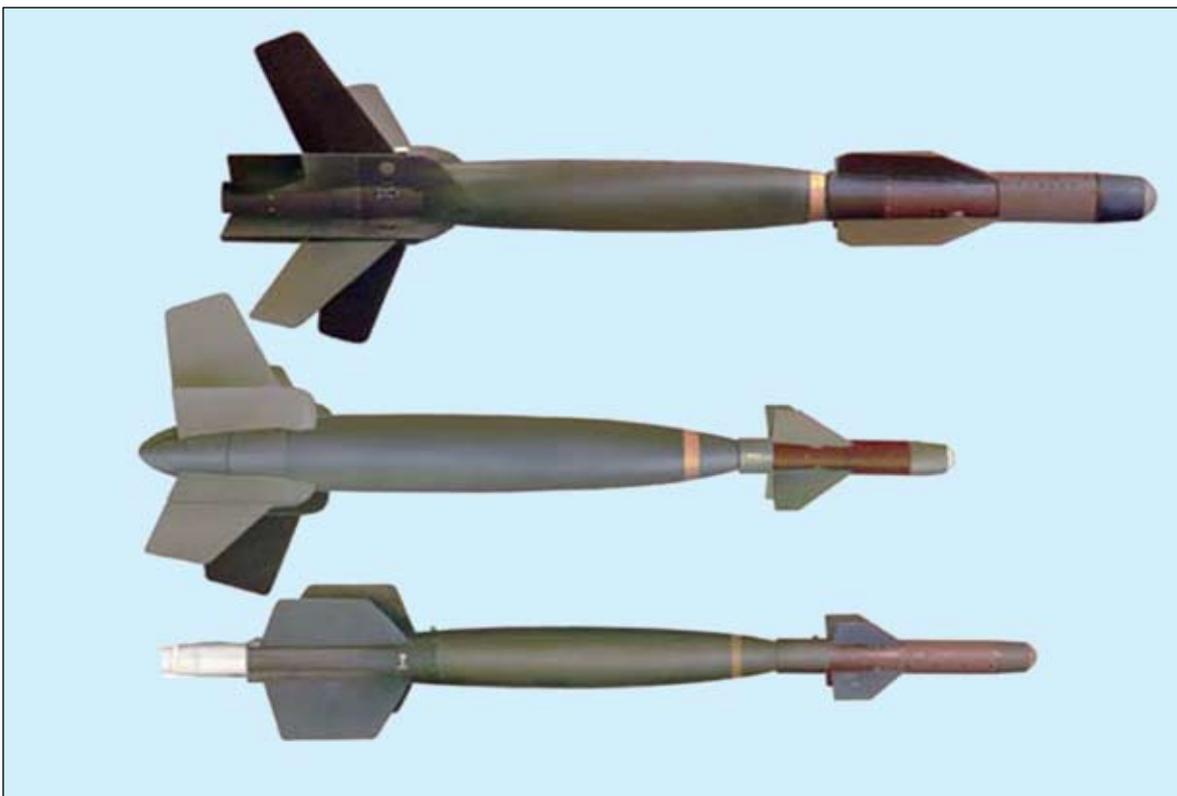
clude the new enhanced variants of Paveway (GPS/INS and laser guidance or dual mode laser guided bombs).

**Does this mean that only the F-16s or the F-18s will operate these missiles?**

Our Enhanced Paveway weapon systems are currently being integrated on 15 aircraft worldwide including the F-16, F-18, Eurofighter and JSF. Raytheon has the unique capability to integrate these new weapon systems on older or legacy aircraft as well. We offer unique integration solutions that are currently employed on aircraft such as the AV-8B Harrier, Super Etendard and Mirage 2000.

**Can you update us on the status of the Paveway IV and also on the delivery of the Paveway IV to the RAF since they were expected in the year 2007?**

All the issues with the Paveway IV deliveries to RAF have been resolved and deliveries are on schedule. The RAF was one of the first countries to prove the value of Enhanced Paveway II in combat. The two variants employ similar technologies. Paveway IV offers a smart fuse and hardened warhead, bringing even more capability to the warfighter.



## Changi Passenger Traffic Hits All-time High Of 36m

**P**assenger traffic at Changi Airport hit an all-time high of 36.7 million in 2007. Last year's tally marked a 4.8 per cent increase over 2006's figure.

Announcing the latest numbers, the Civil Aviation Authority of Singapore (CAAS) also cited two other records: More than 3.5 million passengers passed through Changi in December 2007, the highest ever in a single month; and 125,000 pas-

sengers on Dec 15 was the airport's record in a single day.

Overall, 2007 was 'a good year', said CAAS director-general and chief executive officer Lim Kim Choon, who cited the take-off of the world's first Airbus 380 commercial flight from Changi as a highlight.

The year also saw five new airlines, including Etihad Airways from the United Arab Emirates and homegrown Jett8 Airlines Cargo, join the Changi family.

Apart from these new carriers, the jump in passenger traffic can be traced to continued strong growth from key markets like China and India, said CAAS.

One area was down though - cargo volume.

This fell 0.9 per cent to 1.89 million tonnes as a result of softening demand for electronics in the United States and manufacturers switching to sea freight to save on high jet fuel charges.

Mr Lim said he believes more good things are in store this year for Changi, now served by 81 airlines flying to 190 cities in 60 countries.

The opening of Terminal 3 in January, for example, puts the airport in a good position to tap demand for air travel, he said. With four terminals, including one for low-cost carriers, Changi's annual handling capacity is now about 70 million.

- Nazir Keshvani

# Indian Defence Minister Assures Changed DPP Including Offset Policies

There was a sense of expectancy in the eyes of foreign suppliers on off sets gathered at recently concluded Defexpo 2008, in India as the Indian Defence Minister AK Antony announced that a new revised Defence Procurement Policy-08 which will include amended offset rules will be issued in April as DPP-08.

It was therefore music for the potential foreign vendors to hear from the Secretary of Defence Production, Pradeep Kumar, "We are getting some feedback that there are some difficulties (in MOD's Offset policies), and it is in our interest to make it easier for companies to fulfill their obligations". Pradeep Kumar stated this could come about by the April of this year. This would cut some of the red tape associated with India's dilatory weapons-buying. Some US \$ 20 billion dollars worth of trade is in the offing by way of offsets for 126 fighter deal, the recently placed order for 40 Hawks for the IAF on BAe which will extend to 17 more for the Navy, the Indian Navy's order on Fincantieri for a Replenishment Tanker which is in the final stages, the Army's buy of 155 mm Lightweight air transportable Howitzers short listed between Bae Systems and Singapore Technologies(Kinetics), the Navy's Net Centric Warfare systems order and its Medium Range Maritime Surveillance Patrol Aircraft order between Boeing P-8 Poseidon 737 and



AK Antony  
Defence Minister

EADS 319 Casa version and the large 317 utility helicopters for the Armed Forces. Soon there after the Navy will have to order 12 ASW helicopters for its Type 17A and Type 15A frigates which begin delivery in 2009 from the Mazagoan Docks Ltd, and another Air Force order for heavy lift helicopters should follow.

The MOD offset policy obliges firms to engage in direct offsets, local manufacturing and transfer of certain technologies. The only reported and officially acknowledged offset deal has been between Israeli Aircraft Industries and engineering giant Larsen and Tuobro Ltd and Astra Microwave Products Hyderabad for around \$ 70 million. Astra will supply the Transmit/ Receive switches for the Indian Air Force order of Medium Power Air Defence radars from IAI.

MOD's policy is at variance from the national policy which has been executed by the State Trading Corporation of India STC and is at present

involved in the execution of the large Air India and Indian Air Lines under the new name National Aviation Company of India (NACIL). The order on Boeing and Airbus is for 68 and 43 platforms respectively. The STC has divided the offsets in to direct and indirect offsets (loosely also called a type of counter trade) in the aviation sector and appropriated some in to what is known as the 'Vanilla Sector' which includes other industries and also initiatives in universities. The values of the offsets are large and some details are appended below are being finalised with the platform and engine suppliers.

Airbus, Indian – US\$ 650 million and the obligation of Air Bus is 40 per cent; CFM International, Indian – US\$ 69 million; Boeing, Air India – US\$ 1.792 billion (STC is handling Category A & B) and the obligation is 30 per cent of the deal and GE, Air India – US\$ 100 million.

Most foreign suppliers have scoured the Indian defence and soft ware market and also defence ancillaries and held negotiations to be poised for contracts as MOD requires these details in their bids.

At Defexpo08 Boeing signed a MOU to invest \$ 500 m with Tatas and this a precursor to the revised Offsets policy of MOD which could allow greater offsets in the soft-ware sector as most weapon systems are now majority software driven

DEFEXPO-08 India's land and naval defence show was held from 16th February in New Delhi and it attracted over 200 foreign companies from 30 countries, the largest pavilion being taken up by USA led by its behemoth companies Boeing, Raytheon, Lockheed Martin and Northrop Grumman and others who have deep pockets and most have assured orders, thanks to USA's war in Iraq. USA's delegation was led by William Cohen the former Defence Secretary of USA and the US camp was buoyed by the recently announced contract to buy 6 C-130Js from Lockheed Martin under the FMS route for \$ 1 b and expectations for the 126 fighter deal are high. As the date 3rd March approaches for submitting the technical and financial bids it is Boeing for F-18s and Lockheed Martin for F-16s who will be in the fray with the Grippen, Eurofighter, MiG-35 and Rafale to submit their technical and financial bids for the \$ 10 b deal, which includes 50% Direct Offsets. The first 18 planes are to be delivered within 48 months of signing the contract. At Defexpo the next largest pavilions were the Israeli, Russian, French, Italian and the British all traditional suppliers being in attendance. Most vendors have shared their valid concerns on the large off sets being direct in nature and whether India's defence sector can absorb such a large volume comfortably. Changes are in the offing.

-Cmde(Retd)Ranjit B Rai

## ST Technologies Engineering's 40th Anniversary

Singapore Technologies Engineering began in 1967 as Chartered Industries of Singapore (CIS). Forty years on, what started as a humble bullet factory has grown into a global giant. The group employs more than 18,000 workers in about 100 companies. It has offices and factories in all continents ex-

cept Antarctica and chalked up sales of S\$4.49 billion last year.

Last year, Overhaul & Maintenance magazine ranked ST Aerospace as the world's top provider of maintenance, repair and overhaul services. Such work keeps the world's airliners flying.

Skills developed for repairing, upgrading and modifying

the Republic of Singapore Air Force warplanes set the scene for ST Aerospace's move into performing such work on airliners.

Ten years ago, the defence industries marked their 30th year with the merging of ST Aerospace, ST Electronics, ST Kinetics and ST Marine into ST Engineering.

Today, ST Engineering is more than a weapons company. Commercial services such as airliner maintenance work and ship repairs account for about 70 per cent of the group's sales. Military-related sales to the SAF and customers abroad account for the remaining 30 per cent.

- Nazir Keshvani

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**SUKHAI D SP  
SUPER FUEL  
AD**

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SUKHAI D SP  
SUPER FUEL  
AD

# Cebu Pacific Receives First ATR to Fly in Philippines



**P**hilippine-based low-fare carrier Cebu Pacific has taken delivery of its first ATR aircraft, a brand new ATR 72-500. The airline inked last year two contracts with ATR for the purchase of a total of 10 ATR 72-500s, and options for 8 additional aircraft, valued at over US \$330 million, based upon list prices.

Cebu Pacific will take delivery of its ordered ATRs in 2008 and 2009. All the aircraft are configured with 72 seats and feature the state-of-the-art technological innovations in the field of communications and navigation aid tools and passenger comfort.

**Lance Gokongwei**, President and CEO of Cebu Pacific expressed his satisfaction with the introduction of the first ATR aircraft in the Philippines. With our new ATRs, we will bring our passengers to more destinations with airports that have runway length and strength limitations. We are excited about having the ATR as part of our fleet, and we are pleased to offer our passengers the many advantages of these aircraft, including their optimal comfort". He concluded: "We are very confident about the performance of the ATR aircraft, and the success of our partnership with ATR."

**Stéphane Mayer**, ATR CEO, declared: "We are honoured with this first introduction in such an important and strategic market. ATR is consolidating its strong leader position in Asia, which represents more than 60 per cent of our new orders since the recovery of the turboprop market in 2005. With their ability to land on short runways, their reliability, and their ease of maintenance, the ATR aircraft will bring an optimal service to Cebu Pacific. We will be glad to take part in the expansion of Cebu Pacific and the growth of their network".

ATR touched orders for 113 new aircraft in 2007 a record year. Since the beginning of the programme, ATR has sold 953 aircraft (417 ATR 42s and 536 ATR 72s) and has delivered 757 (397 ATR 42s and 360 ATR 72s), thus posting a current backlog of 196 aircraft.

**The '-500 series' ATRs**  
 With its ATR 42-500 and ATR 72-500, ATR supplies state-of-the-art aircraft with jet-like comfort. The advanced six-blade propeller provides remarkably low noise levels. Low fuel burn and gaseous emissions contribute to make the ATR the "Green Player" of the regional market. All ATR models are compliant with noise regulations and have

a large margin with regard to Chapter IV (ICAO) noise regulations, effective 1st January 2006.

**About Cebu Pacific**  
 Now in its 12th year, Cebu Pacific is the single largest domestic carrier in the Philippines and operates the most number of domestic destinations, flights and routes. Cebu Pacific has the youngest fleet in the Philippines with an average fleet age of 21 months as of 2007 yearend. The airline operates 15 brand new Airbus aircraft, and it flies to 21 domestic and soon to be 14 international destinations.

**About ATR**  
 Toulouse, Southern France-based regional aircraft manufacturer ATR is the world leader in the 50 to 74-seat turboprop market. In 2007 ATR posted a turnover of 1.1 US\$ billion, an increase of 57% compared to 2006.

ATR is an equal partnership between Alenia Aeronautica (Finmeccanica group) and EADS. ATR is certified NF EN ISO 9001:2000 and AS 9100 revision B:2004 / JIS Q 9100:2004 / EN 9100:2003, the worldwide quality standard in the field of aeronautics.

**Tiger Airways Confirms S\$1.3 Billion IAE Engine Order**

## Tiger Airways Confirms S\$1.3 Billion IAE Engine Order

**S**ingapore low fare airline Tiger Airways announced an order for up to 50 V2500-powered Airbus A320-family aircraft engines backed by a V2500SelectSM aftermarket agreement. The combined engine and aftermarket value to multinational aero engine consortium, IAE is in excess of S\$1.3 billion.

The engine order is related to Tiger Airways recently concluded purchase of 50 brand new Airbus A320 aircraft as part of its growth expansion plans. The aircraft order comprises 30 firm aircraft orders with options for a further 20.

"In less than three years, Tiger Airways has become one of Asia's leading low-cost carriers, and has pursued an aggressive growth plan which IAE has been delighted to support through the in-service performance of the V2500 engine and, most recently, with an OEM-backed V2500SelectSM aftermarket agreement," IAE President and CEO Jon Beatty said.

"A repeat order such as this shows the confidence our customers have in our current, market-leading engine and the further gains they will enjoy with the SelectOne build standard," he added.

Tiger Airways CEO Tony Davis said: "We operate in a highly-competitive environment and the V2500's in-service reliability and superior fuel efficiency have made a significant contribution to the success of our operation. One of our key strategies has been stringent cost-control and the V2500SelectSM has demonstrated that

we can look forward to low and predictable maintenance costs while concentrating upon our core business of offering low, low fares."

Tiger Airways is the only international low fare airline to serve the Asia Pacific region from Australia to China and India. This firmly establishes Tiger Airways as the leading low fare airline across Asia-Pacific with new opportunities for affordable travel across Tiger Airways rapidly growing route network.

- Nazir Keshvani

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**ATR**  
**AD**

# Boeing's IDS on Fast Track

**T**hey battle with Airbus for the commercial pie and with Lockheed Martin for the prize in the sky. And now Boeing is going on a jumbo scale with its plans for the Asia Pacific region.

Soon after the Singapore air show kicked off, Boeing Integrated Defence Systems sounded the bell on who's winning in the Asia Pacific region. "Asia is an extremely strategic market and 54 per cent of our total revenue in 2007 came from this region," stated Joe Song, Vice-President, Business Development, Boeing Asia Pacific.

'We recognise the needs of Asian customers who are very sophisticated and want to expand on a big scale'. He emphasised that Asian security issues were intrinsic to the region, with various countries facing threats externally and internally.

Boeing's agenda was to push for a long-term relationship with its partners in this sector. He particularly singled out players in India like HAL and Tata-saying the tie-ups with them made sense since they're good quality units with good delivery schedules-making them good partners.

Song said that Boeing could inject new technologies in return for technologies from this region. He added that Boeing had a long-term commitment to presence in the region; 'Promises made, promises kept' was pretty much the key slogan. The strengths of the company were in delivering and servicing existing prod-



ucts and partnering with local industry.

Song cited that IDS international campaign wins included the C-17 & F/A 18F with Australia and the F 15 SG with Singapore. Asia Pacific was the largest regional defence market and provided a huge number of opportunities. Significantly, the current campaigns were focussing on the F/A-18, P-81, CH 47 and Apache with India, besides the CH 47 with Australia.

India is the land of opportunities as far as Boeing was concerned. Special mention was made of the improvement in bilateral ties between New Delhi and Washington - which have provided a fillip to the industry and business. However, when questioned on the nature of commitment in the P-8 deal, Song said his company was in discussions with the customer for direct commercial sales of the P-8 Naval Reconnaissance planes. "There is competition there," he said.

## Boeing-Garuda Deal:

**L**iving up to the promise of a big announcement, Boeing Company and Jakarta-based Garuda Indonesia on Tuesday revealed at the Singapore Air Show that the airline has ordered four 777-300ER (Extended Range) aircraft. The order is valued at more than \$1 billion.

Garuda also confirmed a previous order for seven Next-Generation 737-800s placed in 2007, and announced that it has converted 18 of its existing 737-700s on order to 737-800s and six 777-200ERs on order to 777-300ERs.

'We are extremely pleased with the support provided by Boeing to restructure previous purchase commitments,' said Emirsyah Satar, president-director and chief executive officer of Garuda Indonesia. 'This will enable Garuda to strategically implement its fleet renewal and expansion plan to meet the demands of a changing marketplace.'

Garuda's shopping list now stands at twenty-five 737-800s and 10 777-300ERs jetliners. The airline also acquired purchase rights for an additional 25 737-800s and 10 777-300ERs.

'The digitally designed Next-Generation 737-800 and 777-300ER are the most technologically advanced airplane families for the single- and twin-aisle market flying today,' said Dinesh Keskar, vice president, Sales, Boeing Commercial Airplanes. As of Jan. 31, Boeing had logged orders for more than 4,500 Next-Generation 737s, and has unfilled orders for more than 2,000 Next-Generation 737 airplanes worth more than \$145 billion at current list prices.

The 777-300ER is the world's largest long-range twin-engine jetliner, capable of carrying 365 passengers up to 7,930 nautical miles (14,685 kilometres).

The Asia Pacific market is growing at 5% to 8% annually and in India the figure is double-digit. However, the biggest growth internationally is expected from the Middle East.

And finally there was fighter talk. Song was asked about the impact on Asia-Pacific region countries of recent problems dogging the F-15. In focus was the in-flight break up of an F-15 C in November last year, which led to the discovery of structural beams not up to specifications in a few other models. Song said that the F-15 in question was a 30-year-old version.

That may be in the past,

but its the future now to where everyone's looking. Song was asked whether mooted the idea of a 6th generation fighter jet was just a spoiler for Lockheed Martin. He said IDS was looking at realistic development and that they had the Super Hornet F 18 to go forward with confidence of staying ahead of the competition.

IDS is presently racing ahead with its network and space systems programme going beyond the US as a market. It has customers in 145 countries and over \$ 29 bn in industrial participation worldwide-with 6,450 suppliers in over 100 countries.

## A Child's Delight Pilot Union Lifts Children's Spirits at the Air Show

**S**ixty children from three charities are realising their dreams of getting up close to their favourite flying machines during the inaugural Singapore Airshow.

Organised by the Airline Pilots Association Singapore (ALPA-S), with the support of

the Singapore Airshow and Events Pte Ltd, the children from the Chen Su Lan Children's Home, Children's Cancer Foundation and Sunbeam Place will enjoy a personalised tour by 20 ALPA-S pilots to the 50 military and civilian aircraft on display, including the A380.

These children are also being treated to the dazzling aerial acrobatic displays by the Black Knights from Singapore and a team from the Royal Australian Air Force followed by lunch provided by Kriston Food and Beverages Pte Ltd.

In conjunction with the

children's visit, ALPA-S will be selling aircraft models and tie pins to raise S\$30,000 for the Chen Su Lan Children's home and the Children's Cancer Foundation. Located at the Booth 120, a the show is the only booth for charity at the event.

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RAYTHEON  
precision  
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# AW139- the 'Copter' of Choice

The leading operators like Heli-Express, Copterline, Luftransport and Helisur-este are opting for AW139, the fastest helicopter in its class produced by AgustaWestland. This helicopter is being showcased at the Singapore Airshow this year. It has a maximum cruise speed of 165 knots (306 km/h), which reduces flight times while also providing greater passenger comfort with its spacious cabin, low noise, low vibration levels and large windows.

Apart from these features, the AW139 also has the largest baggage compartment of any medium-twin helicopter (3.4

ter service role in Northern Norway. Scheduled helicopter flights between Bodø Airport and Værøy Heliport have been operating since 1972.

Helisur-este of Spain operates one of its AW139 helicopters on the Ceuta-Málaga route flying 46 scheduled services per week. The AW139 entered service in April 2006 and can carry up to 15 passengers on the only scheduled helicopter services that links two continents – Europe and Africa. In 2007 a record number of 21,737 passengers were flown, the highest since the service started in 1996.

Copterline of Finland is to



m3 / 120 ft3) with access from both sides of the aircraft for fast loading and unloading.

**Renzo Lunardi**, Senior Vice President Commercial Business Unit, **AgustaWestland** recently mentioned: "We are happy that the AW139 is establishing itself as the helicopter of choice for scheduled passenger services. We know that our customers and the passengers they fly appreciate the high speed, cabin comfort and safety of the AW139. Having been chosen by several of the leading operators of scheduled helicopter services we are confident of more sales in this expanding market."

Luftransport took delivery of an AW139 in September 2005 and were the first customer to operate the aircraft in the scheduled helicop-

restart scheduled helicopter operations very soon between Helsinki and the Estonian capital Tallinn using their first AW139 that has just been delivered and a second aircraft that will be delivered later this year.

In June 2007 Heli Express ordered seven AW139 helicopters. Formed in 1990 to fly passengers on the busy Hong Kong to Macau route, Heli Express has now expanded its route network to include services from Macau to Shenzhen and now performs over 60 scheduled flights per day.

**Apart from these deals, AgustaWestland has also announced that YTL Corporation Berhad of Malaysia has ordered an AW139 medium twin turbine helicopter with an exclusively designed con-**



**figuration for their VIP and Corporate transport operations. This purchase marks the entrance of the AW139 into the Malaysian VIP helicopter market.**

Dato' Mark Yeoh, YTL Group Executive Director said "The additional cabin space together with the certain key safety features of the AW139 make it an ideal air transporters for our Corporate Executives." Capt. Revi Chandran, YTL Group Aviation Manager added, "In addition the excellent hot and high performance and the extra payload available will give us the flexibility to cater towards more diverse operational requirements."

YTL, existing and new Malaysian civil customers will benefit from in-country product support through the newly created AgustaWestland Malaysia Sdn Bhd that is completing the setting up of new maintenance and warehousing facilities at Subang Airport, near Kuala Lumpur, to support all AgustaWestland products including the AW139.

The VIP version the AW139 surpasses all other medium twin-engine helicopters in capability, speed, ride comfort and passenger cabin space. The largest baggage compartment in its class, can accommodate a wide range of cargo for business or personal flights. The AW139's interior

materials are selected from the finest available in the world, selected not only to maintain their beauty and value, but to enhance the passenger experience of flying.

The AW139 is a new generation medium twin-turbine helicopter setting new standards in the medium twin market. Over 100 AW139 helicopters are now in service worldwide including many performing head of state, VIP and corporate transport duties. The AW139 is also the fastest helicopter in its class with a maximum cruise speed of 167 knots and the only medium twin engine helicopter in production that meets the latest certification standards for safety.

Designed with multi-role capability and flexibility of operation, the AW139 is capable of carrying up to 15 passengers or six litters with two medical attendants or up to four litters and four medical attendants at the highest speed, in the most spacious cabin and with the best power reserve of any other helicopter in its class. The AW139 can be used for a number of applications including executive/VIP transport, EMS/SAR, offshore transport, law enforcement and government roles. More than 80 customers in over 30 countries have ordered more than 300 AW139 helicopters so far.

-Rojita Padhay

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# BJETS Partners With Tata Group Company To Launch Asia's First Fractional Private Jet Co

**B**JETS, a new private jet operator in Asia partly owned by India's Tata Group, said it has ordered 40 Cessna and Hawker jets worth more than US\$600 million. Based in Singapore, BJETS seeks to tap into the Asian market for business jet travel, which it believes shows tremendous

growth potential, chief executive Mark Baier said during the company's launch at the Singapore Airshow. "There really are no dedicated business jet operators here, and the ones that are, are reasonably small," Baier said. "We're bringing that dedicated

business fleet here to Asia simply because it is currently underserved." BJETS will start flight operations in May out of Singapore's Seletar Airport. In India, its flight operations will be based out of the new Hyderabad International Airport, Baier said.

which the Taj is known for." "BJETS will combine the best of the US and European models of fractional ownership, block charter and aircraft management services and provide a new benchmark for private aviation services," said Mr. Bala Ramamoorthy, founder and managing director of BJETS and CEO of the Briley Group.

The Briley Group is the majority shareholder in BJETS. The other significant shareholder is Indian Hotels Company Ltd., better as known the Taj luxury brand of Hotels, Resorts and Palaces, a part of the Tata Group.

The company has ordered 20 Cessna CJ2+ jets, which have a typical capacity of five or six seats, and another 20 Hawker 850XP and 900XP planes, which seat seven to eight, he said. BJETS also has options for 10 more Hawker aircraft. At this rate, BJETS will have the biggest fleet of private jets in Asia in its very first year of operations to fly customers throughout India and Southeast Asia.

Mr. R.K. Krishna Kumar, vice chairman of the Tata Group, said: "BJETS will set a new standard in the way we fly and do business in Asia. The Indian Hotels Company is very proud to be an investor in this landmark venture. This will further underline the luxury experience

- Nazir Keshvani



BJETS - Mark Baier, R.K. Krishna Kumar, Bala Ramamoorthy and Gen. Thomas Stafford

# BrahMos Gathers Speed at Singapore Airshow

**T**he BrahMos supersonic cruise missile, one of the most successful products of Indo-Russian military collaboration, is attracting keen interest at the Singapore Airshow. "Various countries are interested, but we have not worked out who to sell it to," said Dr A. Sivathanu Pillai, CEO and managing director of Brahmos Aerospace.

two countries in February 1998. The acronym BrahMos is perceived as the symbolic confluence of two great rivers, the Brahmaputra of India and the Moskva of Russia. The objective of the company is to design, develop, produce and market the supersonic cruise missile BrahMos.

The export potential of the BrahMos, is promising given that the kerosene-fuelled missile is believed to be more affordable than design concepts worked in western countries.

In the pipeline is a hypersonic version which will fly much faster than BrahMos, will have great kinematics energy, range and a powerful scramjet engine to make it a precision lethal weapon. Kinematics is the study of pure motion without regard to force, momentum or energy.

BrahMos evolved out of the joint efforts of Indian and Russian scientists along with a consortium of Indian and Russian industries, under the joint venture company BrahMos Aerospace.

"The hypersonic missile will have a speed of Mach 5 (five times the speed of sound)," Dr Pillai said at the ongoing Singapore Airshow.

The company came into existence consequent to an Inter-Governmental agreement signed between the

"Today we are flying BrahMos at Mach 2.8. From that we are going to increase to Mach 5. So, the programme involves



Dr. A. Sivathanu Pillai,

developing a new scramjet engine to gain that hypersonic speed."

from the atmosphere during its flight stage, liquefy it, separate the oxygen and store it on board for subsequent flight.

The unique feature of this missile is that it will collect air

- Nazir Keshvani

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# Bell Helicopter's Product Line to Meet Customer Demand



**B**ell Helicopter, a leading producer of commercial and military, manned and unmanned vertical lift aircraft has announced that it is optimizing its commercial product line to better serve its customer base and accelerate deliveries of its high-demand aircraft.

Globally recognized for world-class customer service, innovation and superior quality, Bell's global workforce serves customers flying Bell aircraft in more than 120 countries.

The Textron Inc Company a \$13.2 billion multi-industry company operating in 34 coun-

tries with approximately 44,000 employees leverages its global network of aircraft, industrial and finance businesses to provide customers with innovative solutions and services. Textron is known around the world for its powerful brands such as Bell Helicopter, Cessna Aircraft Company, Jacobsen, Kautex, Lycoming, E-Z-GO, Greenlee, Fluid & Power, Textron Systems and Textron Financial Corporation.

Bell is seeing tremendous demand for its 412, 407 and new 429 commercial products, and is taking steps to transform itself into a stronger, more streamlined company.

Bell is increasing its production capacity while terminating production of its 206B3, 427, 430 and 210 helicopter models. All current customer commitments will be met through 2010. Like all Bell products, whether they are currently being manufactured or not, each of these models will continue to be supported by Bell's customer support network known around the world for its unparalleled service that keeps the industry's largest

installed base flying everyday.

In a latest press communiqué, Bell President and CEO Dick Millman stated, "Our most recent analysis of the marketplace has indicated an increased demand for our 407 and 412 commercial helicopters, along with our outstanding new 429 model. We are fully booked on these models until 2010. Consequently, we are both significantly increasing our overall capacity - and eliminating production of some lower volume products. At the same time we are continuing to provide our number one rated customer support. We know that this is the best path

forward to meet our customers' needs."

Analysis of its internal structures has yielded a more strategic allocation of resources and real-time decision-making that Bell anticipates will enable it to deliver a larger number of commercial helicopters each year.

Bob Fitzpatrick, Bell's senior vice president for Marketing and Sales added, "When we looked at the marketplace, we identified important trends in the market segments we serve. The data validated that the capabilities of our most popular models, along with our new product offerings, are well matched to meet market needs and we expect will continue to ensure Bell's strong competitive position.

"Bell is a customer-focused company and we are aligning our capacity to fulfill our customer requirements as quickly as we can. The decision to eliminate these four products was difficult, but we feel our remaining product line-up along with new products in our development pipeline will benefit our customers and position the company for continued growth," Fitzpatrick added.

-Rojita Padhay

## Telair Bags SilkAir Order

# Sliding Carpet Loading Systems for A319/A320s

**S**ilkAir, a wholly own subsidiary of Singapore Airlines, has selected Telair's Sliding Carpet Loading Systems for their brand new A319/A320 aircraft. Airbus will install the systems as Buyer Furnished Equipment (BFE) prior to the delivery of the aircraft to SilkAir.

The regional carrier ordered 12 systems, with an option for a further nine, for its new aircraft scheduled for delivery between 2008 to 2012.

"We are happy to have Silkair, which is one of the Asia Pacific leading regional carriers, joining our growing

global customer base," said Anders Helmner, President of Telair International AB.

"This order has a paramount significance in the Asia context where labour rate is generally affordable, and the loading and unloading of the aircraft is normally accelerated by putting in more men. But statistics and facts have proven that the Sliding Carpet System loads much more efficiently. Most importantly, the systems effectively protect the cargo compartment flooring of the aircraft from damage, preserving the airlines' greatest investment. We are excited

that SilkAir acknowledges these advantages."

Over 60 carriers worldwide fly over 2600 Sliding Carpet Loading Systems with >99% reliability. The system consists of a moving floor belt and attached bulkhead and allow just one on-board operator to load an offload baggage and small cargo from a single ergonomically safe position at the cargo bay door. It has proven to reduce damages to aircraft and baggage, speed up loading and unloading, and enhance ramp operating environment.

Telair International, a business unit of Teleflex Incorpo-

rated, is the one-stop shop for the design, manufacture and support of complete on-board baggage and cargo handling systems for both Airbus and Boeing, in addition to supporting more than 50 carriers worldwide.

Teleflex Incorporated is a diversified company that designs, manufactures and distributes quality-engineered products and services for the medical, commercial and aerospace markets worldwide. Teleflex employs more than 14,000 people worldwide who focus on providing innovative solutions for customers.



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# Tejas- Tiger Cub of the Skies

Tejas' the Indian Light Combat Aircraft (LCA) is the smallest lightweight multi role supersonic aircraft in the world designed to primarily meet the requirements of the Indian Air Force (IAF) and Indian Navy (IN). This single engine tactical fighter aircraft has state-of-art technologies incorporated during its design and development.

Aeronautical Development Agency (ADA), an autonomous body under the Ministry of Defence, is the nodal agency for the design and development of LCA, with Hindustan Aeronautics Limited (HAL) as the principal partner. Indian Air Force, Indian Navy, various DRDO and CSIR laboratories, private and public sector industries of the country have actively participated in the programme and contributed to make the long cherished dream of LCA a reality.

Today, we have two Technology Demonstrators (TDs), three Prototype Vehicles (PVs) and one LSP vehicle undergoing flight trails. More prototypes will join flight-testing in a phased manner, towards obtaining certification leading to induction. Each successful flight is a tribute to the dedication and hard work of team LCA.

Tejas programme also includes design, development, flight testing and operational clearance for two seater Trainer for IAF and both Trainer as



L-R Dr. C.G. Krishnadas Nair, Hon. President of SIATI and Dr. P.S. Subramanyam, Programme Director ADA

well as Fighter for IN.

During the last six months, the Tejas programme has accomplished several significant achievements. Successful firing of a close Tomcat missile from Tejas has been accomplished at INS Hansa Goa. Integration and flight testing the Drop tanks has been completed successfully in Jan 2008. The Lightning Pod which

gives the deep/Night ground attack capability has been incorporated and fight tested successfully. The incorporation and testing the radars will be completed by the end of year 2008. Tejas will be along with its full functionality and sensors and weapons by end 2008.

With smooth, efficient and timely transfer of technology from the design agency to the

production agency, facilities for the manufacture of eight aircraft under Limited Series Production (LSP) have been created at HAL, with the second aircraft of the LSP series set to take to the skies shortly. Based on the current progress of the programme, an order for 20 Tejas aircraft of IOC standard has been placed by IAF, to commence induction by 2010.

## India to Host The Biggest Civil Aviation Show



Ashok Chawla

India will witness the first of its kind international exhibition on Civil Aviation Sector in the coming months. 'India Aviation 2008' to be held from October 15-18, 2008

at Hyderabad will offer tremendous opportunity to the aviation business in India. Ashok Chawla, Secretary, Ministry of Civil Aviation, Government Of India said, 'Keeping in mind the increasing number of domestic and international air passengers, the ministry felt the need to engage pro-actively to hold an event wherein the industry leaders in the field of civil aviation and airport infrastructure sector can show case their strength and activities along with the smaller

companies of the sector.' The exhibition is being organised by Ministry of Civil Aviation, Govt. of India jointly with Federation of Indian Chambers of Commerce & Industry.

Another attraction of the event is that this will be the only civil aviation sector exhibition in India, which will be hosted at an airport. The show will be organised at the Hyderabad Airport on Sardar Patel Road. Hyderabad is well connected to important international destinations. The New world class airport at Hyderabad will be operational from

April 2008.

The event will have exhibition, conference, chalets, flying display, customer demonstration flights, static display and media conferences.

Airports Authority of India (AAI), Air India, Directorate General of Civil Aviation (DGCA), and Pawan Hans Helicopters Ltd support the Aviation organisations. All major aviation companies and organisations in India including scheduled airlines, airport infrastructures and operating companies will support and participate in the show.

# FAA Awards Supplemental Type Certificate To Jade

The Federal Aviation Administration (FAA) presented the first Supplemental Type Certificate (STC) under the Singapore – United States Bilateral Aviation Safety Agreement (BASA) to Jamco Aero Design and Engineering Pte Ltd (JADE).

The STC, which is for cabin interior re-configuration modification carried out on a Singapore Airlines Boeing 747 aircraft, was presented by FAA Senior Representative (Southeast Asia, Aus-

tralia and New Zealand), Ms Mary Walsh, to JADE Chairman, Mr William Tan.

The presentation was witnessed by officials from the FAA, Civil Aviation Authority of Singapore (CAAS) and Economic Development Board. The application for the STC was submitted by JADE, with participation from SIA, SIA Engineering Company and Singapore Jamco. The STC was awarded after the FAA, together with CAAS, successfully carried out a shadow STC certification of the cabin

interior reconfiguration done on the Boeing 747.

The grant of the STC to JADE was made possible under an expanded BASA which was recently revised in September 2007 to meet industry demand. The revised BASA expanded the scope of U.S. acceptance of aeronautical products from Singapore, a key highlight being FAA's acceptance of certain STCs issued by CAAS on transport aircraft.

With the revised agreement, Singapore-based

aerospace companies can now seek CAAS' certification of aircraft interior modification done on any transport category aircraft. This will expedite their U.S. approval through validation.

CAAS' Director-General and Chief Executive Officer, Mr Lim Kim Choon said, "The award of the first FAA STC is a significant milestone for the aerospace industry here.

- Nazir Keshvani



# Etihad Wins Four New Indian Routes

Etihad Airways is to boost its flying programme to India with the addition of four new major cities, Chennai (Madras), Jaipur, Kolkata (Calcutta) and Kozhikode (Calicut) to its expanding global network.

The decision follows successful bi-lateral talks earlier this week between the governments of the UAE and India, aimed at further liberalising flying links between the two countries.

The Abu Dhabi-based airline is now finalising when these services will launch.

James Hogan, Etihad Airways' chief executive, said: "Etihad is always keen to build up its Indian services and we are thrilled to have been given the rights to serve four new cit-

ies in this exciting market.

"I would like to pay tribute to both the UAE and Indian governments, particularly the Department of Transport of Abu Dhabi, for their enlightened vision in further opening up air links between these two great nations and allowing Etihad to expand its services to these developing cities in India."

As per capital of the Indian state of Tamil Nadu, Chennai is located on the Coromandel Coast of the Bay of Bengal and has an estimated population of 7.5 million people.

Kolkata is the state capital of West Bengal and the fourth largest city in India, with a metropolitan population of 15 million. The city is also a major commercial centre and home to India's second larg-

est bourse, the Calcutta Stock Exchange.

The coastal city of Kozhikode will be Etihad's third destination in Kerala to add to its highly successful flights to Kochi (Cochin) and state capital. Thiruvananthapuram (Thiruvandrum).

Known as the Pink City, Jaipur is the capital of the state of Rajasthan in Northern India. It has a growing population of more than 3.3 million people and is one of the most popular tourist destinations in the country.

James Hogan spent two days in September last year in New Delhi meeting the Indian Minister for Civil Aviation Praful Patel, and senior government officials to press the carrier's case for additional flights be-

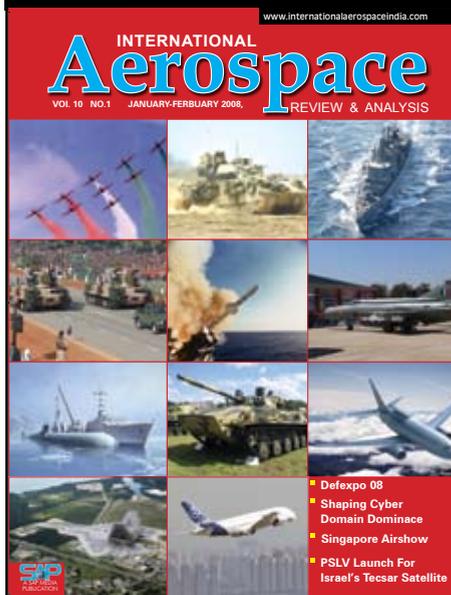
tween India's emerging cities and the capital of the United Arab Emirates.

At present, Etihad operated daily flights from Abu Dhabi to the commercial capital Mumbai and the national capital New Delhi as well as Kochi and Thiruvananthapuram, both in the southern India state of Kerala.

Etihad had set its sight on eight cities in India for new air services from its base in Abu Dhabi with traffic rights to Ahmedabad, Amritsar, Bangalore and Hyderabad still to be gained.

Etihad will continue to press for more access to the Indian market at the next round of inter-governmental bi-lateral talks between the UAE and India. 

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# Abu Dhabi Airport Envisions Record 2007 Growth



**T**he Abu Dhabi International Airport registered a record growth in 2007 with a rise of 31 per cent in the number of passengers and 15 per cent in aircraft movement compared to 2006.

The number of passengers reached 6.926 million in the year 2007 and the number of aircraft movements increased to 86,767.

**Khalifa Al Mazrouei, Chairman and Managing di-**

**rector of Abu Dhabi Airports Company (ADAC)**, the owner and operator of Abu Dhabi International Airport, attributed the strong growth in traffic to Abu Dhabi's growing prominence as an attractive tourist and business destination.

A substantial factor in the airport's strong growth has been the rapid expansion of its home base airline, Etihad Airways. In 2007, the carrier added nine new destinations

in 2007 and increased its number of average weekly services from 463 per week to 719 per week.

The airport's services have won it recognition from passengers and the industry. It has recently won the award for "The best airport in the Middle East and Africa" by the Airports Council International.

ADAC is currently building a new terminal that would increase the airport's capacity

to 12 million passengers from the current seven million. Abu Dhabi International Airport currently receives five million people but in three years is expected to receive nine million.

"Our plans for the future is to deliver best facilities to ensure this airport is a fitting gateway for a world class city and the Emirate as a whole," Al Mazrouei said in a press statement.

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# Indian LCA to Prove Critics Wrong Again?



**S**ingapore. In 1983 India's Defence and Research and Development authority DRDO took on the challenge to design and build a modern light combat fighter jet called LCA Tejas, for the Indian Air Force.

DRDO instead of augmenting the Government owned aircraft manufacturer Hindustan Aeronautics Ltd HAL and allowing the same traditional builder of India's trainer aircraft and the famous Kurt Tank designed HF-24 Marut fighter to get on with the task, decided to 'run without walking'. Had HAL's design department been augmented history may have been different. DRDO also did not attempt to build an Advanced Jet Trainer AJT for starters and took on a larger challenge that no developing country except China has attempted, but today 6 LCAs are flying and next month the heavier twin seat trainer LCA will take to the skies as ground tests are moving ahead smoothly. The programme has been often criticized.

The Indian Air Force is known for its high quality fighter pilots who truly fly well from the "seat off their pants" and they looked to the West and Russia for an AJT and had homed in on the British Hawk.

Pressures and shortage of funds made the Government look to Russian and Italian offers for AJT and a ding dong battle ensued as India does have vested interests in defence business. An AJT pro-

gramme may have helped the LCA but 66 Hawks were finally ordered on BAe four years ago which was actually almost 20 years later when the Mig-21s began to see an unusually high rate of fatal accidents, and even parents of deceased pilots took up the issue. The Defence Minister A K Antony is slated to inaugurate the HAWK training facility on 23rd February at Bidar near Hyderabad and training will begin on the five Hawk 132s which have arrived for Phase three training ( after Phase 1 on HTJ-32 and Kiran MK 2 Phase 2) before the pilots move on to Mirage 2000, MiG -29s and SU-30MKIs, and naval pilots transit to the Mig-29Ks. The inputs of transfer of technology from BAe is bound to help HAL which is the builder of the DRDO designed LCA now in to series production. With India's economy out of the doldrums, funds have been forth coming.

The LCA project was sanctioned for some \$ 100 mill and the journey has been one of expenses rising to over \$ 1 bill and challenges and despite progress till 1998(India's 5 Nuclear blasts took place) the programme had to face severe sanctions by USA. Lockheed Martin who was cooperating with HAL to design the 'Fly By Wire system' and other western vendors shut door in India and withdrew. In private the ADA scientists even complained that the US Engineers left India and even carried away the computers they were

working on. Interestingly earlier in 1991 when India was short of foreign exchange and Indian economy was in doldrums a team from DRDO led by its head Dr VS Arunachalam and ADA Director KG Narayanan visited Singapore and offered Singapore Aerospace Industries to join the project, which included a multi mode radar and the Astra BVR missile. Singapore wanted co-production and was willing, but it was not to be.

The programme has made good progress, foreign vendors are cooperating and it was heartening to hear Defence Minister A K Antony just last week at DEFEXPO say, "We will never abandon the project." There is confidence that the LCA which has completed 840 accident free flights and clocked 430 hours with max speed of Mach 1.4 up to 15 km height will now move ahead faster than what its critics complain and some pointers are tabled why.

- The plane has cleared drop tank trials and HAL is geared up for series production of 20. The designers, some are at Singapore Air Show are confident the progress will be more rapid to obtain Initial Operational Clearance IOC by 2010.
- The Elta EL/M 2032 radar has been fitted in the nose cone along with communications, It is the same radar being fitted in the Navy's Sea Harrier and is a derivative of the EL/M 2022 on the Dorniers -228. HAL has the experience to marry the system

with the weapons.

- Tarang radar warner and ESM trials have been attempted successfully.
- An R-73 Russian missile was successfully launched to commence the challenge of weaponisation.
- The potent Litening pod has been fitted in the fuselage for trials and this pod is the main stay of the IAF. It was used in the Kargil war with success.
- The Head Up Display has been successful and all multi function displays are proving. The LCA can be adapted to a Helmet Mounted Display.
- The Martin Baker Mk 16 seat has been stabilised after the initial Mk 10 fittings.
- The trainer version will fly with the GE-404 IN engine which develops greater thrust and 40 GE engines have been ordered. The question of fitting Kaveri for the first lot is shelved as the engine is not ready.
- All on board systems have functioned better than expected and the flying characteristics of the plane have been complemented by all the test pilots involved in the project.
- HAL proved its capability by cutting metal for the IJT-36 in June 2004 and flew the plane on 7th March, 2007.

The Naval design of LCA which will follow much later has also progressed. India's Midhani has produced the maraging steel MDN 250 locally for the structure and nickel coating technology is available now for the harsher sea conditions., Moog has provided the actuators for the Auto Throttle essential for deck landing and the design of the hook has been completed for 80 ton load. The Russians are helping in setting up a facility for shore landing by Mig-29K at INS Hansa in Goa which will contribute in due course for trials with leading edge vortex controller.

The Indian Air Force Chief Air Chief Marshal Fali Homi Major has supported the efforts of the DRDO and HAL and the LCA may yet prove its critics wrong in the coming years.

 Cmde(Retd) Ranjit B Rai

# Pg No. 32

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