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**RTX Tests New
Battle Management
Concept at
Valiant Shield**

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RTX Tests New Battle Management Concept at Valiant Shield

Capability demonstrated support for the U.S. Army's Mission Command On-The-Move concept

Collins Aerospace, an RTX business, successfully demonstrated mobile, distributed command and control during a series of fires, networking and mission command experiments at INDOPACOM's Valiant Shield exercise.

Collins partnered with the U.S. Army's 1st Multi-Domain Task Force to conduct the experiments—inside a ground vehicle—to rapidly reconfigure and deploy capabilities based on evolving mission needs. The mission command 'on-the-move' concept uses commercial and military communications networks to provide access to multiple intelligence sources. To 'make sense' of the data from various sources, the company used an AI/ML battle management software. This created fused situational awareness that can be shared with bilateral and joint force partners.

"Mobile command and control



capabilities give battle management operators and commanders the ability to replicate fixed site capabilities at the very edge of the fight," said Elaine Bitonti, vice president and general manager, Connected Battlespace & Emerging Capabilities for Collins Aerospace. "Our agile, distributed demonstration concept provides the

Army with the ability to maintain Mission Command On-the-Move."

Valiant Shield is a biennial field training that builds real-world proficiency in sustaining U.S. forces through detecting, locating, tracking, and engaging units at sea, in the air, on land, and in cyberspace in response to a range of mission areas. ■

Raytheon Awarded \$1.2 Billion Contract to Provide Patriot Air & Missile Defense Systems to Germany

This marks the second Patriot order for Germany in 2024

Raytheon, an RTX business, was awarded a \$1.2 billion contract to supply Germany with additional Patriot® air and missile defense systems.

These systems will augment Germany's existing air defense infrastructure with additional Patriot major end items. The scope of the contract includes the most current Patriot Configuration 3+ radars, launchers, command and control stations, associated spares, and support.

"Patriot remains the tried-and-true stalwart of air and missile defense, relied upon by our global customers to deter aggression and defend their interests," said Tom Laliberty, president of Land and Air Defense Systems at Raytheon. "With each additional Patriot system, Germany is enhancing its own air defenses and strengthening NATO's defense posture."

Patriot is the only combat-proven ground-



based air and missile defense capability available in the world to defeat advanced long-range cruise missiles, tactical ballistic missiles, and the full spectrum of air-breathing threats. Patriot is the foundation

of air defense for 19 countries, including Germany, the U.S. and Ukraine, and it continues to demonstrate its effectiveness against the most advanced and complex threats. ■

Eurosatory 2024: Shaping the Future of Defence and Security



Eurosatory, a pivotal event in the defence and security sector, convened once again in Paris from June 17th to 21st, continuing its tradition as a global hub for industry innovation and strategic dialogue. This biennial exhibition attracted 2,028 exhibitors from 61 countries, drawing over 42,000 professional visitors, including a significant international contingent comprising 44% of attendees. Hosting 355 official delegations from 92 nations, Eurosatory underscored its unmatched global reach and influence.

Participants at Eurosatory spanned a diverse spectrum of stakeholders, including manufacturers, start-ups, public and private decision-makers, military personnel, and representatives from international institutions and NGOs. The 28th edition of Eurosatory proved particularly notable for its historically high attendance and the breadth of its discourse on current challenges and future solutions in defence and security.

Inaugurating the event, Sébastien Lecornu, Minister of the Armed Forces, emphasized Eurosatory's importance, global scope, and strategic role. "This show is certainly also a show for the military and not just for manufacturers to take stock

of all the operational needs of the armed forces. And it is obviously deep down, this change in culture that we are seeing, in which we have a real rapprochement between the customer, the soldier and the producer, the manufacturer." remarked Minister Lecornu.

Against the backdrop of global geopolitical, economic, technological, societal, and environmental shifts—including impacts from the pandemic and

conflicts like those in Ukraine—Eurosatory 2024 served as a critical platform for navigating these complexities. The event featured 120 conferences and over 450 speakers, affirming its status as a global forum for exchanging insights and strategies.

Industry leaders showcased concrete solutions aimed at equipping states to confront evolving security challenges, underscoring Eurosatory's pivotal role in



enabling a better understanding of the major underlying trends that are lastingly shaping our century.

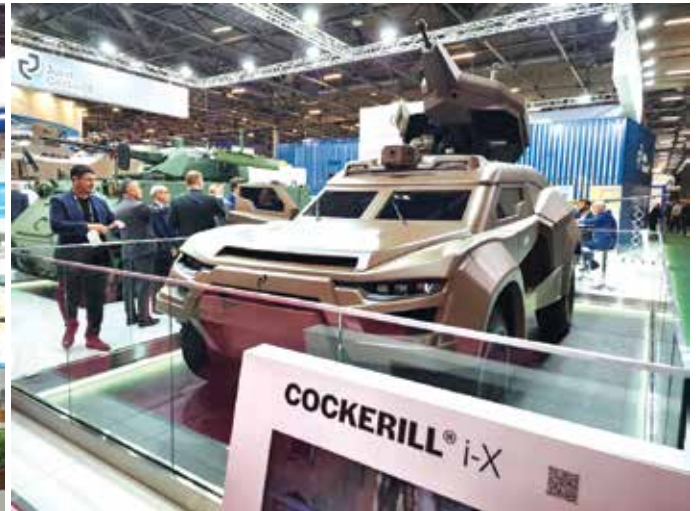
As the world continues to navigate unprecedented global challenges, Eurosatory remains at the forefront, facilitating dialogue and innovation essential for safeguarding international security and stability.

Indian participation

India had a significant presence at the event and few of the major aerospace,

defence and security firms - both in the public and private sector - participated in the event. The Indian companies include, Advanced Weapons and Equipment India Limited; Aeron Systems Pvt Ltd; Ashoka Manufacturing Pvt Ltd; Associated Chambers of Commerce & Industry of India; Bharat Electronics Ltd (BEL); Bharat Forge Limited; Bit Mapper Integration Technologies; Brahmastra Defense Techno Products Limited; Defence Research and Development Organisation (DRDO); Entremonde Polycoaters Limited;

Futura Automation Pvt Ltd; Gliders India Limited; Hyderabad Precision Mfg. Co. Pvt. Ltd.; India Optel Limited; Jeet & Jeet Glass and Chem P Ltd; Kusumgar Corporates Private Limited; Mahavir Spinfab; Mku India; Paladin Safety; Precision Electronics Limited; Raphe Mphibr; Rotary Connectors Private Limited; Sanathan Allied Industries Llp India; Sandeep Metalcraft Pvt. Ltd.; Smp Private Limited; Yantra India Limited India and Zen Technologies Limited India. ■





All Set for the Spectacular Farnborough Air Show

The Farnborough International Air Show 2024 is set to take place from July 22-26 at the Farnborough International Exhibition & Conference Centre in Hampshire, UK. This premier event will bring together global leaders in aerospace and defence for five days of showcasing cutting-edge technology, forging strategic partnerships, and advancing sustainable aerospace initiatives.

Since its inception in 1948, the Farnborough Air Show has been renowned for unveiling iconic aerospace innovations, from the Vickers VC10 to the Concorde, Airbus A380, and Lockheed Martin F-35 Lightning II. Second only to the Paris Air Show in scale, the 2022 edition attracted over 74,000 professionals from 102 countries, including 250 government and civil delegations, and garnered extensive global media coverage.

Building on this success, FIA 2024 is set to redefine industry standards and expectations. This year's show will spotlight critical themes such as Space, Defence, Sustainability, Innovation, Future Flight, and Workforce Development. Global leaders, including Airbus, Boeing, Rolls-Royce, RTX, GKN, and GE Aviation, will be exhibiting their latest aircraft, innovations, and technology at the event.

Key highlights of the five-day event include the Space Zone, featuring the latest in space technology and launch operators; the Business Connections Exchange program, facilitating tailored meetings between buyers and suppliers; and the Networking Business Lounge sponsored by Lockheed Martin, providing an exclusive environment for strategic discussions.



Aerospace Global Forum

The 2024 event will see the return of the award-winning Aerospace Global Forum (AGF), the global platform that aims to champion change and drive immediate action, accelerating the transition to a net-zero economy. AGF will feature keynote sessions, and panel discussions focusing on sustainability and defence, held at the Space and FINN Theatres and the Global Urban Advanced Air Summit (GUAAS).

Pioneers of Tomorrow

A highlight on the final day is "Pioneers of Tomorrow," a dedicated STEM-focused event designed to inspire and engage the next generation of aerospace leaders. This initiative underscores the industry's commitment to nurturing talent and fostering innovation.

Pitch Competition for Start ups

Aerospace Xelerated (AX) will host a pitch competition where start-ups can showcase their innovations. Winners will receive £5,000 and mentorship opportunities to help scale their businesses, reinforcing Farnborough's role in promoting entrepreneurial spirit within

the aerospace sector. All shortlisted start-ups will also benefit from the opportunity to showcase their business to key stakeholders from leading organizations within the aviation, aerospace & defence industries.

Box4Kids Event

Farnborough International will host the Box4Kids charity event, providing unique experiences for seriously ill and disabled children and their families. Aerospace industry leaders attending the air show, including Accenture, Embraer, Deutsche, Honeywell, Kallman, ATI, AIA, and Boeing, are providing exclusive chalets, aircraft tours, meetings with pilots, and activities for the guests.

Commitment to Sustainability

Sustainability remains a core focus of FIA 2024, highlighting advancements in sustainable aviation technologies and practices. Farnborough International has the goal of operating with net zero carbon emissions to be able to deliver exceptional events and experiences for years to come.

Looking Ahead

As one of the greatest global shows, it fosters collaboration and innovation across the aerospace and defence sectors. Gareth Rogers, CEO of Farnborough International, aptly describes the air show as a catalyst for excellence and innovation within global aerospace and defence industries. The Farnborough International Air Show 2024 promises to be more than a mere industry event—it is poised to shape the future of aviation through technologies, strategic partnerships, and a commitment to sustainability. ■



Embraer to Unveil Next-Gen Aviation Innovations at Farnborough Airshow



Embraer is gearing up for a prominent presence at the upcoming Farnborough International Airshow, the foremost event in aviation and aerospace, slated for July 22-26. A key highlight will be the debut of the brand-new E-Freighter, the E190F, making its inaugural public appearance. The company is currently riding a wave of positive momentum across all sectors as it prepares to celebrate its 55th anniversary.

Embraer's line up at the show highlights its leading portfolio of aircraft for commercial aviation and defence, which includes the E195-E2, the world's most efficient and quietest narrow body; the E190F, an E-Jet cargo conversion that is making its debut at the show; the C-390 Millennium multi-mission military tactical transport; and the A-29 Super Tucano

multi-role aircraft, the gold standard for a broad range of missions such as light attack, aerial surveillance and interception, and counterinsurgency.

The C-390 Millennium and the E195-E2 will also take part in the flight display.

The E190F, which performed its maiden flight earlier this year, is a passenger jet converted to a freighter (E-Freighter). The E-Jets freighters (E190F and E195F) were launched in 2022 to meet the changing demands of e-commerce and modern trade, which require fast deliveries and decentralized operations.

"I'm sure this will be another great airshow for Embraer. Farnborough is the main stage of the aviation industry, and we look forward to meeting with our customers, partners and many other stakeholders as we kick off our 55th

anniversary celebrations," said Francisco Gomes Neto, President and CEO of Embraer.

"Embraer is experiencing very positive momentum, growing in a profitable way through the execution of our business strategy."

Inside the Embraer chalet visitors will have the chance to take a closer look at multiple activities related to innovation, new technologies and the company's roadmap to sustainable aviation, such as the Energia Family concept aircraft. Also, Eve Air Mobility will be presenting updates on the development of its electric vertical take-off and landing vehicle (eVTOL) and the Urban Air Traffic Management software Vector, including a full-size eVTOL cabin mockup and a unique virtual reality (VR) flight experience. ■

Radia's WindRunner - Aerospace Solution for Climate Change

Radia, which is participating at Farnborough International Airshow is building the world's largest aircraft, the WindRunner, to meet climate change. At Farnborough International Airshow one can participate in an onshore wind energy market estimated at up to \$10 trillion by 2050.

WindRunner is designed to transport the

largest wind turbine blades available today and the even larger ones planned for the future, what the company calls GigaWind, directly to wind farm sites.

The result will be widespread availability of consistent, low-cost clean energy for the grid, the production of green molecules including green hydrogen and sustainable aviation fuel (SAF),

and commercial power users such as hyperscalers and data centers.

WindRunner will help meet escalating demand for carbon-free electricity, drive growth in the wind energy market, which is estimated to be up to \$10 trillion by 2050, create compelling business opportunities in renewables – including for Radia's aerospace partners. ■



Naval Group Delivers 2nd Gowind® Corvette Al Emarat to UAE

The delivery ceremony of the Gowind® corvette Al Emarat, ordered by the United Arab Emirates to Naval Group, took place on 27th June 2024 in Lorient, in the presence of an official delegation of the United Arab Emirates Navy, led by the Deputy Commander of the UAE Navy, Brigadier Abdulla Al Mehairbi.

Al Emarat is the second Gowind® corvette ordered by the UAE to Naval Group in 2019. Built in Lorient and launched in May 2022, she started her sea trials in October 2023, at the time when the first corvette, Bani Yas, was delivered.

The Al Emarat crew will continue in France its operational ship training provided as part of the service solutions offered by Naval Group. The ship will begin its transit to the UAE under the Emirati flag in July, with an expected arrival in Abu Dhabi in August.

"I am very honoured to be with you on this symbolic day for Naval Group as we deliver the second Gowind Al Emarat to the UAE Navy. Naval Group has demonstrated its unwavering commitment to the success of the Bani Yas program, in close cooperation with the UAE Navy, and we are proud today to welcome our Emirati guests for the flag transfer ceremony of the Al Emarat corvette.", stated Olivier de la Bourdonnaye, Naval Group Executive Vice-President, Surface Ships.

The UAE Navy now owns sea-proven surface combatants, incorporating the most advanced technologies and adapted to their specific needs thanks to the modular design of the Gowind® family.

The Gowind® corvettes for the UAE



Naval Group's Lorient shipyard, incorporating equipment manufactured locally by UAE industry. Naval Group is stepping up its relationship with the United Arab Emirates Navy to best meet its future challenges. The Group is also developing its partnership with local industry, so as to offer the greatest support for the maintenance of these two Gowind® corvettes in the United Arab Emirates. This program symbolizes our commitment to deliver the state-of-the-art systems to the UAE Navy and our vocation to anchor Naval Group in the country on a long-term basis, notably by developing industrial cooperation with our local partners.

Gowind® corvettes, multi-mission combat ships designed for naval superiority

The Gowind® corvette is a major success with 11 units already chosen by several navies. It offers multiple capabilities and is designed to perform at the highest level the full spectrum of naval defence and maritime security operations.

Multi-role by design, it features

capabilities in all warfare areas, carefully integrated from the earliest stages of the engineering process.

Robust, well-equipped and ocean-going, the Gowind® corvette is already sea-tested, tough and stealthy. Thanks to a Combat Management System designed by Naval Group and innovative structural solutions,

High performance in all fields of combat, integrated by the SETIS combat system and an innovative modular integrated mast (PSIM);

Automated systems for simplified use by a reduced crew;

Deployable resources (heavy helicopter, UAVs, RHIBs) to extend the ship's combat capabilities;

Scalability to meet customer needs and incorporate the latest innovations.

Technical features

Overall length: 102 m

Overall beam: 16 m

Displacement: 2,800 t





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The Defense Industry has an Essential Role in Mitigating Climate Change



Both the effects of climate change and the global tensions it drives, directly affect the defense and security industry. At the recent World Defense Show 2024, General Tom Middendorf, Chairman of the International Military Council on Climate and Security, delivered a compelling address on the imperative of climate-proofing defense organizations and capabilities.

Sustainability measures have become part of every industry in terms of production, but climate change presents far greater challenges to the defense industry and requires more wide-ranging solutions, with its inherent threats to global security.

General Tom Middendorf, Chairman of the International Military Council on Climate and Security, spoke to a select audience at the recent World Defense Show 2024, about the pressing need to understand and mitigate the devastating effects of climate change, outlining four key reasons why environmental sustainability is crucial for the defense sector: global trends and resource scarcity; climate change as a risk multiplier; resilience against severe weather events; and changing policies and legislation.

Middendorf began by highlighting four competing global trends that are creating an increasing gap between demand and supply. He said: "We have experienced a growing world population, almost doubling in size during this century, leading to a doubling in demand for water,

for food and for resources. Meanwhile we are already experiencing a decreasing availability of a widening range of those resources."

He explained how two additional trends increase the difficulty of bridging that growing gap. "The first is climate change, leading to sea level rise, desertification and increasing vulnerability to flooding. Climate change reduces the global livable and arable space and effects our ability to meet those growing demands."

This is exacerbated by a second trend - "the geopolitical move from globalization to a more fragmenting world, which affects the multilateral mechanisms that we have and makes it harder to find global solutions to global problems," he explained.

Middendorf stressed the unsustainability of current resource consumption patterns and advocated for innovation in resource efficiency and circularity to mitigate future conflicts arising from resource scarcity. He said: "It's clear that we cannot bridge that gap by producing more in the way we are doing now. It's clear that competing

harder over access to resources is not a sustainable solution. It's also clear that we need to reduce our resource dependency through innovation on circularity, and the use of alternative less scarce materials, because if we don't bridge that gap, we will only deplete our resources more rapidly, resulting in severe supply chain disruptions, and we will only see more global competition potentially leading to conflicts."

On a regional level, Middendorf cited climate change as a risk multiplier, underscoring how it exacerbates existing tensions and drives instability globally, something he had faced firsthand. He said: "I've been involved in more than 20 crisis areas all over the world. In Afghanistan, I experienced how water scarcity led to tensions among farmers and how that was exploited by extremists. In Iraq I saw how water was used as an instrument of power, with the occupation of the Mosul dam. In Somalia, Sudan and Mali, the increasing droughts drove people away from their homelands, driving them into despair and into the hands of extremist organizations.

I saw how climate change in itself may not directly lead to conflict, but how it acts as a driving force of local and regional instability."

He emphasized the need to address water stress, drought-induced migration particularly in Africa, and vulnerability to flooding in densely populated regions. He said: "Look especially to Southeast Asia, home of almost two billion people, often living in mega cities located at rivers and coastal areas. This is also the factory of the world. With most of our supply lines running through these areas it's like a ticking bomb. One can only imagine the disastrous and disruptive potential effects of rising sea levels and intensifying rain periods to these urbanized areas."

Middendorf highlighted the increasing frequency and severity of natural disasters, stressing the importance of protecting assets and infrastructure, saying: "Every year we witness new records being set. Last year we had 66 natural disasters with more than US\$1 billion damage each. Overall, the damage was \$350 billion with 95,000 victims all over the world, which probably doesn't include the second order effects."

"Globally only one third of those costs were covered by insurance. The US alone had 28 of these disasters with US\$93 billion in damages and the trend is going up, making it increasingly difficult to insure these kinds of risks. This makes protection of our assets, of our hubs, of our supply chains, and of our vital infrastructure, also a crucial element of sustainability. Next to the need to protect fighting infrastructure, defense organizations can also expect an increasing demand for humanitarian

assistance and disaster relief operations."

Middendorf acknowledged the global shift towards net-zero emissions and the integration of climate considerations into defense policymaking. He emphasized the need for defense organizations to reduce their carbon footprint while maintaining operational effectiveness. He said: "Defense is the largest emitter of CO2 in any country and has a responsibility to take. At the same time, however, there is a genuine concern that moving to net zero affects the effectiveness of operational units. It is therefore crucial to develop sustainability in such a way that it also contributes to operational effectiveness and this can be achieved through a focus on self-sufficiency.

"The more operational units can generate their own energy, their own water, print their own spare parts, use remote diagnostics, etcetera, the more autonomous they can become and the more we can reduce the enormous logistical supply chains that we have now."

To address these global challenges, Middendorf proposed a three-pronged approach to defense energy transition. The first is adaptation of peacetime facilities, implementing civil best practices and technologies in non-operational settings, such as harbours, airports and barracks.

He suggested that the second level should focus on light and medium operational capabilities where civil technologies can be used and integrated into new military concepts. He explained: "This is about adapting our current force and about being a smart integrator of new technologies that support self-sufficiency. Defense could create living labs with

defense industries for experimentation and fielding of these kind of concepts."

The final area is the energy intensive high-end capabilities, such as naval vessels, air fighters and heavy combat vehicles, where technology is not as advanced. He suggested that the industry needs to invest in research and development for energy-efficient platforms and equipment, with built in self-sufficiency.

He gave examples: "We can for instance use 3D printing to produce spare parts on the spot. In deployed areas we can use robotics for a range of logistical functions, even up to conducting remote surgery. We can use remote diagnostics and augmented reality for our maintenance systems for battle damage repairs, thereby reducing the need to deploy large logistical units into mission areas. There is a whole new range of options appearing, but they do require us to be open minded."

Middendorf also stressed the importance of public-private cooperation in advancing energy transition efforts, noting the civil sector's leadership in innovation, and pointing out that the defense sector has some catching up to do, saying: "If we want to futureproof our military forces and our businesses it's crucial that we build climate resilience in a public-private effort. We need to become the quickest to adapt."

Addressing such an elite and influential audience of government and industry leaders at the World Defense Show. Middendorf's presentation sounded a rallying cry for the defense sector to embrace sustainability and climate resilience as an essential component for safeguarding global security. ■

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RS-25 Engines Are Ready For Artemis IV



Aerojet Rocketdyne, an L3Harris Technologies company, has completed modernizing the four flight-proven RS-25 engines that will help power NASA's Space Launch System (SLS) rocket on the Artemis IV mission. Artemis IV will be the first flight of the enhanced Block 1B configuration of the super-heavy-lift rocket and the last to use engines remaining in inventory from the space shuttle program.

Aerojet Rocketdyne has upgraded the Artemis IV engines with modern flight computers that will allow them to withstand the higher temperatures due to being located next to the SLS solid rocket boosters. NASA and Aerojet Rocketdyne completed testing of the flight computers and former space shuttle main engines for the first four Artemis missions at the Stennis Space Center in Mississippi.

Artemis IV marks the debut of the

upgraded SLS Block 1B rocket featuring the exploration upper stage powered by four Aerojet Rocketdyne RL10 engines. The first three Artemis missions are using the SLS Block 1 configuration that uses the interim cryogenic propulsion stage powered by a single RL10.

"The SLS Block 1B upgrade is a game changer that will enable the most ambitious missions ever attempted," said Kristin Houston, President, Space Propulsion and Power Systems, Aerojet Rocketdyne, L3Harris. "The new universal stage adapter above the exploration upper stage provides 24% more volume for a co-manifested payload than an industry-standard five-meter-class payload fairing."

Crewed versions of the SLS Block 1B with the exploration upper stage will be capable of delivering 38 metric tons of payload to cislunar space in a single mission, versus 27 metric tons for the SLS Block 1. This means more than 10 metric tons of additional cargo can fly with every crewed mission. Cargo-only versions of the enhanced vehicle will be able to deliver 42 metric tons to cislunar space.

Beginning with Artemis V, the SLS deep space exploration rocket will use newly manufactured versions of the RS-25 engines that take advantage of production efficiencies and advances in manufacturing to reduce unit costs by more than 30% from the shuttle versions, while also flying at a higher thrust level.

ARTEMIS IV
FIRST FLIGHT OF SLS BLOCK 1B
 SLS Block 1B is a game changer with its Exploration Upper Stage (EUS)

3x More Mass to Lunar Orbit Than Any Other Rocket

SLS BLOCK 1B CREW with EUS can launch more than 83,000 LBS or **38 METRIC TONS TO THE MOON**
40% MORE PAYLOAD TO THE MOON

EUS Fueled Weight 278,000 LBS
 The Four-Engine EUS Provides **97,360 LBS OF THRUST**
RL10 x 4

Mixed Manifest and Cargo Version Accommodates all Payload Sizes from Cubesats up to Largest Telescopes

ORION + 10 mT CO-MANIFESTED PAYLOAD TO THE MOON
 42 mT PAYLOAD TO THE MOON

SLS CO-MANIFEST PAYLOAD with secondary satellite and multiple ESPA-class satellites
 SLS 8.4m FAIRING with large aperture telescope

THE RS-25 ENGINE
 The Most Reliable, Flight Proven Liquid Booster Rocket Engine Ever Built
 The Artemis IV engines flew on 29 shuttle missions carrying 142 astronauts to orbit – more than any other set of shuttle-era engines used for Artemis

ENGINE 2050 6 Flights	ENGINE 2044 13 Flights
ENGINE 2051 10 Flights	ENGINE 2052 9 Flights

NO. 2052 recorded the one-millionth second of cumulative Space Shuttle Main Engine firing time during a test in 2004

ARTEMIS IV - NASA'S SLS (SPACE LAUNCH SYSTEM) POWERED BY AEROJET ROCKETDYNE
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Two U.S. Army T901 Improved Turbine Engines at Sikorsky for Black Hawk® Integration



Two of the U.S. Army's T901 Improved Turbine Engines (ITE) arrived at Sikorsky, a Lockheed Martin company (NYSE: LMT), signaling a new phase of Black Hawk® helicopter modernization efforts. The T901 engine, which is manufactured by GE Aerospace, will increase the UH-60M Black Hawk helicopter's performance, including lift capability and range, providing Army commanders more options for planning and executing missions.

The T901 engine will increase the Black Hawk's power by 50%, while also improving fuel efficiency and is a critical component of the roadmap to a modernized Black Hawk – a key part of Lockheed Martin's 21st Century Security® vision.

"Increased performance and range offered by the T901 are high-value capabilities the Army is able to implement on the Black Hawk in a cost-effective way that will not require expensive re-engineering," said Hamid Salim,

vice president of Army and Air Force Systems at Sikorsky. "The ITEP and other enhancement efforts ensure the Black Hawk remains in operation well into the 2070s, securing its position as the Army's foundational tactical air assault and utility aircraft of choice."

What's Next

Sikorsky is positioned to conduct a multi-aircraft test program to support the Army's ITEP acquisition milestone schedule.

The two T901 engines will be installed in one Black Hawk test aircraft for ground runs and flight testing.

Aircraft hardware is already on hand to accept two additional T901 engines for installation into a second Black Hawk test aircraft, which will accelerate the test program.

The Army's Utility Helicopters Project Office (UHPO), Aviation Turbine Engines Project Office (ATE PO), and Sikorsky have completed several key program milestones to prepare for this integration, including:

Successful completion of the H-60M Preliminary Design Review and Critical Design Review.

Software Formal Qualification Testing (FQT) for the Integrated Vehicle Health Management System (IVHMS) and is on track to complete the Flight Management System FQT this summer.

Receipt and completion of all aircraft test instrumentation required to support the test program.

Receipt of all aircraft "A-kit" hardware required to install two T901s into the H-60M in preparation to execute ground test and flight test.

"We view this as an extension of the work we've completed on ITE with our Future Attack Reconnaissance Aircraft (FARA) prototype and are even better positioned for a timely and simplified integration of the engine into the H-60M, due to data and insights we've retrieved from successful ITE tests completed to date," said Salim.

Sikorsky received, installed, and successfully conducted engine light-off of the T901 engine in the FARA prototype aircraft. The ongoing FARA test program is specifically designed to collect data relevant to the Black Hawk engine integration to support risk reduction for the Black Hawk flight test program.

A Modernized Black Hawk

Sikorsky H-60M modernization efforts continue to be primarily focused on ITE, as well as Modular Open Systems Approach/digital backbone and Launched Effects. Digital innovations, such as a new sustainment digital twin, improve safety and mission readiness while reducing costly downtime and unscheduled maintenance. ■



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2024

Organizers :  The Society of Japanese Aerospace Companies (SJAC)

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Liebherr-Aerospace Showcases Major Innovations at FIA 2024



Under the theme “Transform. Develop.Sustain.” Liebherr-Aerospace is set to showcase its cutting-edge advancements at the Farnborough International Airshow 2024. The company is addressing the aviation industry’s pressing challenges through significant investments in research and technology, focusing on electrification, 3D printing, and hydrogen solutions. Liebherr is committed to enhancing the sustainability and efficiency of air transport, paving the way for a greener future.

Long wingspan for improved aerodynamics with folding mechanism

Innovative designs of thinner and longer wings support more CO2-efficient flying by improved aerodynamics. Liebherr is supporting this trend by offering reliable folding mechanisms for future more efficient aircraft platforms. An example is the Boeing 777X’s folding wingtip, which “beckons” visitors to the Liebherr booth. The moving mock-up (scale 1:1.15) shows how the wingtip of the extra-long wing can be folded upward to better fit the airport infrastructure. Components of the

mechanism, such as the angle gearbox, the power drive unit, and numerous actuators are designed by Liebherr and will be on display.

3D Printing and Digitization

Liebherr’s cutting-edge 3D printing capabilities are already in use, with additively manufactured components flying daily. On display at Farnborough International Airshow is an additively manufactured housing of a secondary locking actuator. According to in-depth tests, the aviation-certified housing is of lower weight, and its performance is 100% equivalent to that of a conventionally manufactured component. In addition, digital means are revolutionizing the way Liebherr designs, builds and maintains aircraft systems.

Electrification and Decarbonization

In aircraft that will be more electric in the future, the engine will be decoupled from onboard power consumers for increased efficiency. Electric power will replace bleed air or hydraulic systems and enable the introduction of electric air management and actuation systems. Liebherr’s exhibits show that the company can already master these requirements today: Electromechanical actuators (EMA) and a hologram of the high-efficiency power



L3Harris Electronic Warfare System Completes Rigorous Testing



L3Harris Technologies has completed testing on its latest Viper Shield Electronic Warfare (EW) system, which enhances protection for F-16 pilots, at the U.S. Air Force's Integrated Defensive Avionics Laboratory.

The hardware and software testing, known as Drop 4, was on the AN/ALQ-254(V)1 Viper Shield suite, which identified and displayed threats of interest and sorted through them in challenging backgrounds to provide precise situational awareness.

"Viper Shield demonstrated radar warning receiver functionality in dense background radio frequency environments, and successfully detected, identified, sorted and cued multiple threats," said Air Force Col. Michael Rigoni, EW Program

Manager, F-16 System Program Office, Wright-Patterson Air Force Base, Ohio. The colonel attended the test and added that "completion of Drop 4 testing provides program risk reduction and marks an important level of system maturity."

The Viper Shield Drop 4 capability uses production representative hardware and integrates fully with all F-16 systems. Drop 4 also ensures that the pilot has enhanced protection against threats through improved pilot-vehicle interface with the Countermeasures Dispensing System, which can release chaff and flares from the aircraft.

"Viper Shield is a virtual electronic armor that will improve the ability of F-16 fighter pilots to detect threats earlier so they can defend themselves and utilize that data to

increase their survivability," said Ed Zoiss, President, Space and Airborne Systems, L3Harris. "We will continue to refine and advance this system for warfighters globally."

L3Harris designed Viper Shield as the baseline EW system for the global F-16 Block 70/72 fleet and can enhance both offensive and defensive capabilities. The system has proven its performance with other important milestones, including seamless integration with the onboard APG-83 AESA radar.

L3Harris can also install Viper Shield onto legacy F-16 configurations inside the aircraft or in fully integrated pod configurations utilizing the existing Line Replaceable Units mounted externally.

pack (HEPP), are on display.

Leader in the development of electromechanical actuators

As electrification moves on in aviation, Liebherr has further added small electromechanical actuators to its product portfolio. The new concept specifically addresses the quickly emerging AAM (Advanced Air Mobility) sector. It is also essential for smaller aircraft, business jets,

and helicopters.

Liebherr's product approach offers scalability for small installation envelopes,



a favorable power-to-weight ratio, and high reliability.

Liebherr-Aerospace will present its extensive capabilities from July 22 to 26 in

Hall 4, Booth 4918.

Highlights will include innovative solutions for local hydraulic supply, modular electromechanical drives, and compressors for fuel cell technology aimed at onboard energy supply.

EDGE and Adani Defence sign Agreement in Defence & Security



EDGE, one of the world's leading advanced technology and defence groups, has signed a milestone cooperation agreement with Adani Defence & Aerospace, one of the leading defence and aerospace companies of India.

The agreement aims to establish a global platform leveraging the defence and aerospace capabilities of both companies to bring together their respective product portfolios and cater to the requirements of global and local customers. This includes evaluating cooperation across EDGE's and Adani's core product domains, including missiles & weapons covering airborne, surface, infantry, ammunition, and air defence products, platforms & systems covering unmanned aerial systems (UAS), loitering munitions, counter drone systems, unmanned ground vehicles (UGV), as well as electronic warfare (EW) and cyber technologies.

The agreement will explore the establishment of R&D facilities in India and the UAE; the setting up of development, production and maintenance facilities of defence and aerospace solutions to not just serve the two captive markets, but also Southeast Asian and wider global markets.

Hamad Al Marar, Managing Director and Chief Executive Officer, EDGE Group,

said: "Our agreement with Adani Defence & Aerospace, represents a significant milestone, strengthening our ties within India's defence industry, and underscoring our mutual commitment to advancing UAE-India military ties. This agreement reflects our dedication to bringing our customers the most advanced and sophisticated products to the market, while taking advantage of the global export potential including critical UAE-grown technology. We are keen to setup the joint platform between Adani Defence and EDGE to pioneer new technologies and set new standards in advanced military equipment and defence sector."

Ashish Rajvanshi, Chief Executive

Officer, Adani Defence & Aerospace remarked, "Our collaboration marks the beginning of a new era in enhancing defence capabilities, emphasizing our commitment to advance technological prowess and promoting bilateral defence cooperation between India and the UAE. It is a reflection of our shared vision to fortify our nation's capabilities by not just delivering cutting-edge solutions for the two countries but also setting new benchmarks in the global defence landscape."

The agreement with Adani Defence & Aerospace reinforces EDGE's commitment to India's defence industry, a market of strategic importance for the group. ■



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Rostec Sets up Mango Round Production in India

JSC Rosoboronexport, part of the Rostec State Corporation, has organized the production of 3VBM17 Mango rounds in India, marking a major milestone for India in enhancing its defence capabilities. This strategic alliance aims to localize the production of 125 mm 3VBM17 Mango rounds, featuring an armor-piercing sub-caliber projectile, marking a critical milestone in India's path towards self-sufficiency in defence manufacturing.

Rosoboronexport facilitates licensed production at the customer's facilities and actively engages in establishing joint ventures to manufacture Russian military products in partner countries. The 125 mm Mango round, designed for T-72 and T-90 tanks, incorporates the 3BM42 fin-stabilized armor piercing sub-caliber round capable of penetrating modern tanks equipped with composite armor. Various versions of these combat vehicles



ROSOBORONEXPORT

are currently operational within the Indian Ground Forces.

Sergey Chemezov, CEO of Rostec State Corporation, emphasized the strategic importance of such partnerships, highlighting the transfer of technology and competencies as crucial advantages. Projects like the licensed production of T-90 tanks and Mango shells with armor-piercing capabilities underscore Rostec's commitment to fostering indigenous defence capabilities in partner countries.

Looking ahead, plans include launching gunpowder production in India to achieve maximum localization for the Mango shells. This initiative aligns with India's

Make In India and Self-Sufficient India programs, aiming to enhance domestic manufacturing capabilities and reduce dependence on imports.

Alexander Mikheev, CEO of Rosoboronexport, highlighted the completion of key production facilities in India underlining a significant phase in Russian-Indian cooperation. "Rosoboronexport's work in India is a striking example of a comprehensive industrial partnership, within the framework of which joint projects have been developed for all types of armed forces with a unique degree of cooperation between enterprises of the two countries for the world market.", he said.

This strategic alliance not only bolsters India's defence capabilities but also sets a precedent for international collaboration in defence manufacturing, underscoring the mutual benefits of technology transfer and joint production ventures. ■

GAMIT's ROAM wins 10-year Air Tahiti Nui Tender

GAMIT Ltd (an AMAC Aerospace Company), based in Stansted, UK has been awarded a long-term contract to digitize the technical records of flag carrier Air Tahiti Nui's fleet using the aerospace industry leading software produced by GAMIT called ROAM (Records Online Asset Management) which is a digital records management solution.

Air Tahiti Nui will utilize ROAM to further modernize its operations and seamlessly manage the technical documentation generated by its fleet, using ROAM's unique functions and integrations to monitor & manage airworthiness compliance. ROAM is a tool that will enable Air Tahiti Nui to capitalize on operational efficiencies optimizing manpower and aid their continuous improvement objectives.

Yannick MERMET, Maintenance & Engineering Director of AIR TAHITI NUI says "Air Tahiti Nui remains committed to the modernization and digitalization of its airworthiness management and



monitoring tools and processes. We were looking for a user-friendly and efficient solution for our transition from paper-to digital for our maintenance records archives and ROAM proved to be the solution best suited to our needs."

Chris Leese Wood, Chief Operating Officer of GAMIT says "We are incredibly proud to have been selected as Air

Tahiti Nui's choice for digital records management. Air Tahiti Nui's commitments to sustainability and its forward-thinking approach to new technologies makes it a dream customer for Gamit and its product ROAM. We are looking forward to working very closely with their team to ensure a highly successful experience in fully digitizing its records". ■

Boeing to Acquire Spirit AeroSystems

Boeing announced that it has entered into a definitive agreement to acquire Spirit AeroSystems [NYSE: SPR]. The merger is an all-stock transaction at an equity value of approximately \$4.7 billion, or \$37.25 per share. The total transaction value is approximately \$8.3 billion, including Spirit's last reported net debt.

Each share of Spirit common stock will be exchanged for a number of shares of Boeing common stock equal to an exchange ratio between 0.18 and 0.25, calculated as \$37.25 divided by the volume weighted average share price of Boeing shares over the 15-trading-day period ending on the second trading day prior to the closing (subject to a floor of \$149.00 per share and a ceiling of \$206.94 per share). Spirit shareholders will receive 0.25 Boeing shares for each of their Spirit shares if the volume-weighted average price is at or below \$149.00, and 0.18 Boeing shares for each of their Spirit shares if the volume-weighted average price is at or above \$206.94.

"We believe this deal is in the best interest of the flying public, our airline customers, the employees of Spirit and Boeing, our shareholders and the country



more broadly," said Boeing President and CEO Dave Calhoun. "By reintegrating Spirit, we can fully align our commercial production systems, including our Safety and Quality Management Systems, and our workforce to the same priorities, incentives and outcomes – centered on safety and quality."

Boeing's acquisition of Spirit will include substantially all Boeing-related commercial operations, as well as additional commercial, defense and aftermarket operations. As part of the transaction, Boeing will work with Spirit to ensure the continuity of operations supporting Spirit's customers and programs it acquires, including working with the U.S. Department of Defense and Spirit defense customers regarding defense and security missions. "We are proud of the role Boeing plays in supporting our men and women in uniform and are committed to ensuring continuity for Spirit's defense programs," said Calhoun.

Airbus SE and Spirit have also entered into a binding term sheet under which Airbus will acquire, assuming the parties entered into definitive agreements and receipt of any required regulatory approvals, certain commercial work packages that Spirit performs for Airbus concurrently with the closing of the Boeing-Spirit merger. In addition, Spirit is proposing to sell certain of its operations, including those in Belfast, Northern Ireland (non-Airbus operations), Prestwick, Scotland, and Subang, Malaysia. The transaction is expected to close mid-2025 and is subject to the sale of the Spirit operations related to certain Airbus commercial work packages and the satisfaction of customary closing conditions, including regulatory and Spirit shareholder approvals.

PJT Partners is acting as lead financial advisor to Boeing, with Goldman Sachs & Co, LLC and Consello acting as additional advisors. Sullivan & Cromwell LLP is acting as outside counsel to Boeing.

Thales Ramps up Rocket Production in Belgium for European Defence

Thales Belgium, the European leader in 70-mm rocket systems, has inaugurated a new production line at its Herstal site, a few months after the Belgian Minister of Defence Ludivine Dedonder signed a letter of intent expressing her support for the ramp-up of Thales's ordnance production activities. The higher production rates will make it possible to respond faster to the ammunition requirements of the armed forces.

The rocket is the NATO-standard 70-mm (2.75 inch) calibre currently being used in Ukraine. The new capacity is a major step in a €20 million investment plan launched in 2023 and boosted by the support of the Belgian government and the European Union's Act in Support of Ammunition



Production (ASAP) plan. The inauguration was attended by the Belgian Minister of Defence, Ludivine Dedonder.

By ramping up production, Thales is helping strengthen the ammunition capabilities of Europe's armed forces. "The inauguration of this new production line at the Thales site in Herstal demonstrates the Group's commitment to constant innovation and investment in strategic



production capacities for Europe. Supported by the Belgian government and the European Commission as part of its Act in Support of Ammunition Production (ASAP), Thales Belgium is making its expertise as European leader in 70mm rocket systems available to the European armed forces", said Hervé Dammann, Executive Vice President, Land and Air Systems, Thales.

Liebherr-Aerospace Expands its Service Capacities in the USA



Liebherr-Aerospace Saline, Inc. is expanding its industrial campus in Michigan (USA) and celebrated recently the groundbreaking with invited guests, the Management, and over 300 employees. With the new building the company will be able to meet the growing customers' demand for MRO services covering the Liebherr products that are on board a wide variety of commercial aircraft and business jets.

Liebherr-Aerospace Saline, Inc. is enhancing its aftermarket service capacities with the fifth expansion since 1993. Spanning 33,000 ft² (3,065 m²), the new expansion will adjoin the existing heat transfer facility, which commenced operations in 2016.

The new facility will cater to Liebherr-Aerospace Saline's growing heat transfer aftermarket demand of testing, repair, overhaul, and recore capacity for Liebherr products installed on Airbus, Boeing, Embraer, Mitsubishi, and Bombardier aircraft. Additionally, the new facility will accommodate the internal movement of certain other products, thus increasing the required landing gear processing capacity at the main facility.

Recognizing Liebherr-Aerospace Saline's as well as the global success of Liebherr's heat transfer activities, Alex Vlieland, Chief Customer Officer at Liebherr-Aerospace & Transportation SAS, said: "The positive and overwhelming acceptance by our customers of the

heat transfer servicing set-up in Saline has allowed us to expand our offerings worldwide, thus validating our strategy to be close to our customers. Furthermore, by expanding the network we are shortening the overall Turn Around Time by eliminating transportation time, cutting down on cost and lowering our carbon footprint".

Will Dew, Managing Director Commercial at Liebherr-Aerospace Saline, Inc. added: "It's also imperative that we recognize the sustaining contributions of our employees. This impressive milestone combined with our summer employee appreciation event acknowledges their resilience and innovation which continues to anchor the success of the company". ■

HyPrSpace Successfully Conducts First Test of its Hybrid Rocket Engine

HyPrSpace, an innovative startup specializing in hybrid propulsion, announces the success of the first bench test of its engine at DGA Missile Tests on its site in Saint-Médard-en-Jalles (Gironde). This test marks a crucial step in validating its patented hybrid propulsion technology and demonstrates the successful transition from their theoretical models to full-scale applications.

The tests of the Terminator engine aimed to verify that the propulsion technology developed by HyPrSpace, supported by the General Directorate of Armament (DGA) and the Defense Innovation Agency, achieves the predictive performance of their theoretical models.

This success also validates the transition



Boeing Delivers Rocket Stage to NASA, Will Launch First Humans Around the Moon Since Apollo



Boeing has provided NASA with the second core stage of the Space Launch System (SLS) rocket. Built at NASA's Michoud Assembly Facility (MAF), the core stage is designed to send the Artemis II crew to lunar orbit for the first time in 50 years.

Boeing delivers rocket stage to NASA, will launch first humans around the moon since Apollo (Boeing photo.)

The Boeing-built rocket stage, which is the largest component of the Artemis II mission, will be loaded onto the Pegasus barge and transported 900 miles to NASA's Kennedy Space Center. Once there, it will be integrated with the other Artemis II components, including the upper stage, solid rocket boosters, and NASA's Orion spacecraft inside the Vehicle Assembly Building. This integration is a crucial step in preparation for the Artemis

II launch, scheduled for 2025.

"Boeing-built products helped land humankind on the moon in 1969, and we're proud to continue that legacy through the Artemis generation," said Dave Dutcher, vice president and program manager for Boeing's SLS program. "Together, with NASA and our industry partners and suppliers, we are building the world's most capable rocket and paving the way to deep space through America's rocket factory in New Orleans."

The delivery of Core Stage 2 signifies a major achievement in the development of the SLS rocket. This core stage, measuring over 200 feet tall and powered by four RS-25 engines, alongside two solid-fueled booster rockets, will provide the 8.8 million pounds of necessary thrust to propel Artemis II and future missions into space.

SLS is the only rocket capable of carrying crew and large cargo to the moon and beyond in a single launch. Its unmatched capabilities will deliver human-rated spacecraft, habitats, and science missions to the moon, Mars and beyond.

As a leading global aerospace company, Boeing develops, manufactures and services commercial airplanes, defense products and space systems for customers in more than 150 countries. As a top U.S. exporter, the company leverages the talents of a global supplier base to advance economic opportunity, sustainability and community impact.

Boeing's diverse team is committed to innovating for the future, leading with sustainability, and cultivating a culture based on the company's core values of safety, quality and integrity. ■

from a prototype to a full-scale operational version, experimentally confirming the reliability and efficiency of the technology.

At the same time, HyPrSpace has acquired key skills in the operability of a rocket engine using cryogenic fuel, ensuring safe and efficient future launches. The internally developed data acquisition system has also been validated, ensuring

its proper functioning and performance in real conditions. This strategic project demonstrates HyPrSpace's ability to provide an innovative, competitive, and responsive access-to-space solution. The startup thus positions itself as a key player in the NewSpace sector and launch vehicles.

The next development steps will focus on

integrating the liquid oxygen (LOX) tank into the engine, adding a thrust vector control (TVC) system, and conducting tests simulating real space flight conditions. These successive iterations will bring HyPrSpace closer to finalizing an engine ready for the suborbital mission planned for 2026. ■

L3 Harris Grows European Presence with New Italy Office

L3Harris Technologies has opened a new location in Italy, marking a milestone in its expansion within Europe. “It is crucial for us to strengthen our presence in Italy in order to provide greater value to our customers and to drive continued growth in the country and across Europe,” said Dave Johnson, Vice President, International, L3Harris. “Our office in Rome is strategically positioned to serve as a central hub for engaging with local partners to support our expansion across the region and within NATO.” L3Harris has also appointed Tiziana Cotugno as the head executive for L3Harris Europe. Cotugno will operate from the Rome office and oversee the company’s European Advisory Board comprised of directors and local business leadership.

L3Harris is actively supporting the Italian Joint Intelligence Centre and Italian Air Force through the integration of the Joint



Airborne Multi-Mission Multi-Sensor System program. This program is one of several that are integral to L3Harris’ expanding array of multi-mission business jet solutions available across various commercial platforms to support critical

global security operations.

L3Harris, via its acquired company Calzoni, has a distinct and long history in the country, having collaborated with the Italian Navy on projects dating back to World War I.

Lockheed Martin to Create Next Generation Weather Satellite Constellation

NASA has selected Lockheed Martin to develop and build the nation’s next generation weather satellite constellation, Geostationary Extended Observations (GeoXO), for the National Oceanic and Atmospheric Administration (NOAA). The baseline contract is for three

spacecraft with options for four additional spacecraft. The total estimated value of the contract including options is \$2.27 billion. “Our team is excited and ready to move forward to design and field this critical national capability,” said Kyle Griffin, vice president and general manager of

Commercial Civil Space at Lockheed Martin.

“Our GeoXO design draws heavily from what we’ve learned with GOES-R spacecraft over the last 15 years, while incorporating new, digital technologies not only onboard the vehicles but in the design and development of this powerful, weather-monitoring platform of the future.” The GeoXO mission will expand upon critical observations of weather provided by the Lockheed Martin-built GOES-R Series geostationary satellites to include new observations of oceans and air pollution.

GeoXO’s new capabilities will deliver more accurate weather forecasting and address emerging environmental issues. The first GeoXO launch is planned for the early 2030s and will maintain and advance NOAA’s critical geostationary observations through the late 2050s. The platform features SmartSat technology that enables new software pushes and capabilities as environmental data needs change over time.



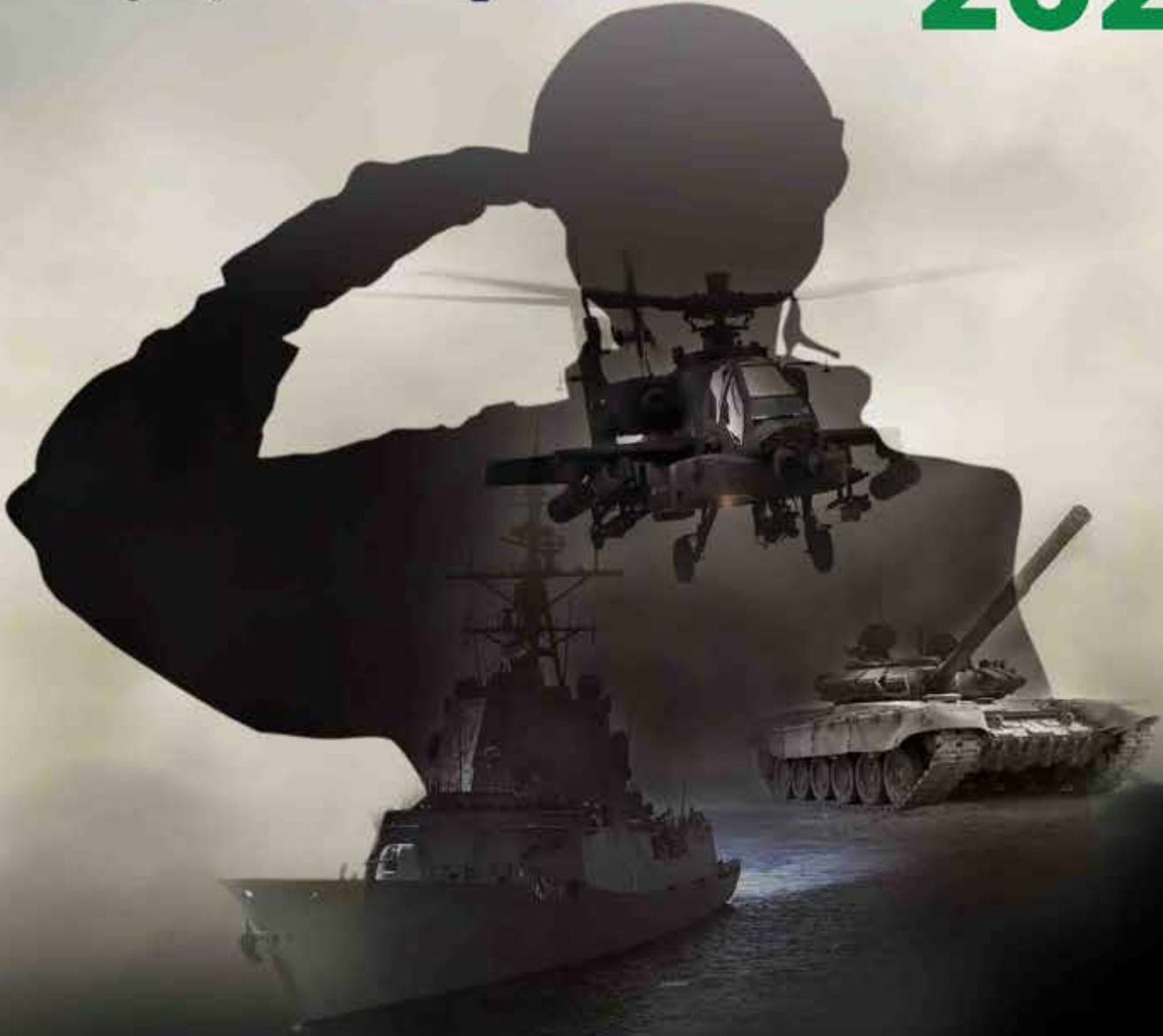


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Rafael Advanced Defense Systems Achieves 'A' Rating Upgrade from S&P

Rafael Advanced Defense Systems Ltd. has been upgraded to an 'A' credit rating by S&P Global Ratings, with a stable outlook. This significant achievement underscores Rafael's robust operating performance, resilient profitability, and strong competitive position within the aerospace and defense industry.

Enhanced Competitive Position: S&P Global Ratings has reassessed Rafael's business risk profile from 'fair' to 'satisfactory,' reflecting our strengthened market position and the increasing demand for our cutting-edge defense solutions.

"Our view of Rafael's competitive advantage and improved profitability underpins our reassessment of its business risk profile. Rafael's improving competitive advantage and high demand for many of its products and services mean it is well placed to capture customer demand, both from the Israeli Ministry of Defense and from overseas governments and militaries."

S&P Global Ratings Report

Strong Financial Health: Our financial risk profile has been upgraded from 'modest' to 'minimal,' underpinned by a solid net cash position. Rafael's cash balances are projected to exceed \$4 billion through 2024, further cementing our financial stability.

Growing Order Backlog: Rafael boasts an impressive order backlog exceeding ILS



Yoav Tourgeman
CEO, Rafael

50 billion (approximately USD 13 billion), representing about three years of revenue. This surge is driven by heightened defense budgets and robust demand for our advanced defense systems.

Positive Outlook: The stable outlook from S&P Global Ratings is based on the expectation of continued strong demand for Rafael's products and services, bolstered by rising government defense budgets. This trend is anticipated to support our order backlog and financial performance over the next two years.

Dr. Yuval Steinitz, Chairman of Rafael: "We are honored to receive the credit rating upgrade by the world-leading rating agency S&P especially during such a challenging time for the country and society as a whole. Here, again, we see that also economically Rafael can achieve the impossible. In the heat of the tireless efforts invested by the company during the "Swords of Iron" war and despite the



Dr. Yuval Steinitz
Chairman, Rafael

extensive reserve enlistment from its ranks, Rafael continues to grow consistently with improvements of tens and hundreds of percent compared to previous years in most parameters. Rafael's employees and senior directors work with determination, around the clock, especially during this wartime, to realize the company's vision and be a significant pillar in the security of the State of Israel."

Rafael CEO Yoav Tourgeman: "Rafael maintains its growth trajectory, demonstrating excellent financial results and stability. The S&P rating, the highest ever awarded to an Israeli company, is a testament to this. The year 2023 was a record year for Rafael, marked by technological breakthroughs and robust business activity, a trend we continue into 2024.

Since the onset of the war, Rafael's systems have been saving lives daily and making a decisive contribution to the 'Swords of Iron' efforts." ■

Croatia Triples Black Hawk Fleet with Eight Additional Helicopters

Croatia has officially purchased eight additional UH-60M Black Hawk helicopters built by Sikorsky, a Lockheed Martin company, via U.S. government Foreign Military Sale, bringing the country's Black Hawk fleet total to 12. The deal, which includes aircraft, organizational equipment, spare and repair parts, and associated support equipment, is a critical investment by Croatia and

significantly bolsters its self-defense and security in the region and that of the NATO alliance.

"We deeply value Croatia's continued trust in the Black Hawk helicopter, which is operated by the U.S. and more than 35 other nations, including NATO allies, offering unmatched global and regional interoperability," said Hamid Salim, vice president, Army and Air Force Systems at

Sikorsky.

"Croatia's decision to acquire eight more of the latest generation UH-60M Black Hawks for its Armed Forces, tripling its fleet, will support ongoing modernization efforts and strengthen the Balkan region's ability to deter current and future threats."

Croatia's Black Hawks can support a range of roles, including troop lift, border security, counter-terrorism, medical

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December



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evacuation, search-and-rescue, resupply or external lift, and combat support.

All nations operating the Black Hawk, including a significant and growing number of NATO-member nations, benefit from a range of operational capabilities and a global ecosystem of more than 5,000 Hawk aircraft produced. Additionally, continued global investment in the UH-60M/S-70M Black Hawk has proven the aircraft to be the top choice for modernizing and replacing legacy medium-lift utility helicopter fleets. The Black Hawk has flexibility to conduct a variety of operations at greater ranges and in the most challenging environments, increasing survivability and overall effectiveness for 21st Century Security® missions. ■



EDGE and Thales Collaborate on Radio Communications Manufacturing in UAE



KATIM, an EDGE Group entity and leader in the development of ultra-secure communication solutions, and Thales, will start discussing the co-development of Software Defined Radio technologies in the United Arab Emirates (UAE).

A declaration of intent was signed at the international defence and security show, Eurosatory, by Didier Pagnoux, CEO of KATIM, Abdelhafid Mordi, CEO of Thales in the UAE and Christophe Groshenry, Vice President, Radio of Thales, and in the presence of Hamad Al Marar, Managing Director and CEO of EDGE Group, Waleid Al Mesmari, President, Space & Cyber Technologies of EDGE Group, Pascale Sourisse, President & CEO of Thales International, and Christophe Dumas,

CEO of Thales Secure Communications & Information Systems in France.

To meet the demands of the UAE's large-scale high-tech programmes and its exportation needs, KATIM and Thales will work jointly on the full cycle development, production and maintenance of airborne and long range HF (high frequency) radio communication solutions. Both companies will bring their expertise to the partnership and will promote and export the co-developed solutions-based portfolio to the international market. Didier Pagnoux, CEO of KATIM, said: "Partnering with Thales represents a significant milestone for EDGE, underscoring the global confidence in our leadership in advanced communications technology. By combining our expertise, we will develop sophisticated Software

Defined Radio solutions that meet the rigorous demands of both domestic and international markets. This collaboration aligns with our goal of driving innovative secure communication solutions and fully supports the UAE's ambitious global exports roadmap. We eagerly anticipate the transformative outcomes of our joint efforts."

Christophe Salomon, Executive Vice-President, Thales Secure Communications & Information Systems, said "As a worldwide leader for tactical radios and on-board communication solutions for land, air and naval forces, Thales is proud to partner with EDGE in radio communications solutions. The partnership is fully aligned with the Group's development strategy in the UAE." ■

Lockheed Martin Announces Industrial Participation, Offset Opportunities for Thailand



Lockheed Martin announced that it would continue its legacy of delivering economic value to Thailand through a robust industrial participation proposal – also known as an “offset” proposal – driven by the Thai government’s evaluation of the F-16 Block 70/72 for its future fighter program.

Projects offered as part of the F-16 Block 70/72 proposal include support for the creation of a Research and Development Center to advance Thailand’s capabilities across a number of sectors, including manufacturing and agriculture; advanced aerospace engineering training for industry partners in Thailand and the Royal Thai

Air Force; manufacturing workforce development projects; technical assistance for an advanced datalink upgrade to ensure interoperability with existing fleet; advanced fighter maintenance training for the Royal Thai Air Force; investigating supply chain opportunities for Thai industry; and sustainment capabilities developed within Thailand.

“Lockheed Martin values our 40-year partnership and history with Thailand and the Royal Thai Air Force, and we are confident the F-16 Block 70/72 will complement its existing F-16 fleet,” said Aimee Burnett, vice president, business development, Integrated Fighter Group at Lockheed Martin. “The F-16 Block 70/72 would deliver the advanced 21st Century Security® capabilities and performance needed to address Thailand’s most pressing defense requirements.”

She added:

“Lockheed Martin brings decades of experience delivering value to local industries and workforces, including a successful history of executed offset projects with Thai industry partners and the Royal Thai Air Force. We are excited to bring that same mindset to the F-16 Block 70/72 program.”



Rolls-Royce Collaborates with Technology Partners for Stationary Power Generation



Rolls-Royce has started, with a consortium of five companies and research institutes, to develop the necessary technologies for a highly efficient first-of-a-kind hydrogen combustion engine to drive combined heat and power (CHP) systems. Under the Phoenix (Performance Hydrogen Engine for Industrial and X) project, funded by the German Government, the consortium aims to generate the same electrical and thermal energy (power density and efficiency) as currently available through natural gas CHP units in the higher power range of up to 2.5 MW.

When fuelled by green hydrogen, this next generation stationary energy plant will be able to run in a completely carbon neutral manner. The project is being funded by the German Federal Ministry for Economic Affairs and Climate Protection with a total of almost five million euros.

We are convinced that combustion engines will remain an essential part of the provision of a reliable energy supply during the energy transition," said Dr Jörg Stratmann, CEO of Rolls-Royce Power Systems. "We are making them climate-friendly with sustainable fuels. That's why we at Rolls-Royce are investing in the development of next generation hydrogen engines. The consortium in the Phoenix

project, with its combined expertise, is a guarantee of the success in tackling this major technical challenge."

Rolls-Royce already has developed a gas-powered combustion mtu engine which can use hydrogen as a fuel, but the Phoenix project will develop the technology for an even more efficient next generation hydrogen engine. Hydrogen is one of several alternative fuels being used by Rolls-Royce to make its engine portfolio more sustainable.

It is making its portfolio of reciprocating mtu engines compatible with alternative fuels such as hydrotreated vegetable oil (HVO) and e-fuels, as well as being heavily involved in exploring the use of methanol for marine applications.

The participants in the Phoenix project are developing the necessary components for a first-of-a-kind hydrogen combustion engine, such as the injection system, the piston group and the ignition system, as well as a completely new lubricant. The partners in the project are:

Rolls-Royce as coordinator; the Institute for sustainable mobile propulsion systems at the Technical University of Munich; MAHLE Konzern; Fuchs Lubricants Germany GmbH; the German Federal Institute for Materials Research and Testing (BAM); and Robert Bosch AG.

The joint project is scheduled to run for three years. By then, a technology concept will have been developed that is sufficiently mature for use in a complete prototype engine.

H2 power plants follow natural gas and biogas plants as the backbone of the energy transition

As part of its power plant strategy, which includes the expansion of renewable energies, the German government has decided in favour of building more gas-fired power plants to compensate for the variability of renewable resources. In particular, smaller, decentralised gas engine plants that can flexibly compensate for the fluctuating feed-in of wind and solar power to the grid, which varies depending upon weather conditions. To reduce CO2 emissions, biogas gensets and, in some cases, the first gas engines converted for hydrogen are currently being used.

As soon as the availability of green hydrogen is ensured on a large scale, the technology of highly efficient hydrogen cogeneration plants promoted in the Phoenix project will be ready for use," explained Tobias Ostermaier, President of Stationary Power Solutions within Rolls-Royce's Power Systems division.

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Saudi Arabia orders 4 additional Airbus A330 MRTTs

The Kingdom of Saudi Arabia has ordered four additional Airbus A330 Multi Role Tanker Transport (MRTT) aircraft for the Royal Saudi Arabia Air Force (RSAF).

The first of these aircraft will enter into conversion at the beginning of 2026; they will enter into service and join the RSAF in 2027 to carry out air-to-air refuelling and transport missions.

“This new order demonstrates the high level of customer satisfaction with the A330 MRTT”, said Jean-Brice Dumont, Head of Air Power at Airbus Defence and Space. “This is the third contract signed by Saudi Arabia for the A330 MRTT, making the RSAF one of the largest MRTT operators in the world”.

The contract also includes a logistics support package with spare parts, training services and service support for the new four aircraft. All the RSAF A330 MRTT are configured with hose and drogue pods, boom system and also refuelling receptacle, which allows the A330 MRTT to be refuelled from boom-equipped



tankers.

Industrial cooperation

As part of this contract, Airbus signed in January 2024 an Industrial Participation (IP) agreement with GAMI (General Authority for Military Industries) for the development and growth of the industrial ecosystem in the region in support of Vision 2030, a Saudi-government programme that aims to diversify the country’s economy.

This agreement also includes the transfer of technology and knowhow of the RSAF A330 MRTT to local companies. SAAMS, the joint venture created between SAMI (Saudi Arabian Military industries) and Airbus, will be the main vehicle for industrial localisation.

The A330 MRTT is the most capable new-generation tanker and transport aircraft with 90% market share outside the USA with 82 orders from 15 countries in Europe, Asia, America and Oceania. ■

Milrem Robotics’ Shows TheMIS UGV at DSA

Milrem Robotics, Europe’s leading robotics and autonomous systems developer, is to introduce its most advanced autonomous combat support unmanned ground vehicle (UGV), TheMIS, at the Defense Services Asia (DSA) exhibition in Kuala Lumpur.

The TheMIS UGV is an operationally proven multi-role UGV that considerably enhances combat effectiveness while reducing manpower requirements. These vehicles can be utilised for a wide range of missions, including logistics, casualty evacuation, reconnaissance, and, equipped with remote weapon systems, for combat operations, making them invaluable assets for modern armed forces.

The vehicle on display at DSA is configured to transport cargo and for casualty evacuation. The same systems are combat-proven and are currently deployed in Ukraine. The Royal Thai Army is using a combat TheMIS UGV.

“UGVs, equipped with advanced technologies and autonomous capabilities,



are already playing a crucial role in assisting and even replacing soldiers on the battlefield. These cutting-edge systems not only enhance operational efficiency but also significantly mitigate risks to human life,” explained Patrick E. Shepherd, Chief Sales Officer of Milrem Robotics.

“Moreover, the deployment of UGVs reduces the burden on human troops, allowing them to focus on strategic planning and higher-level tasks while delegating repetitive or dangerous missions to autonomous systems,” Shepherd added.

TheMIS UGVs are equipped with Milrem Robotics’ Intelligent Functions Kit – MIFIK – that leverages state-of-the-art

artificial intelligence and machine learning algorithms and allows operators to plan missions using waypoint navigation and set en-route vehicle behaviours. The UGVs can operate autonomously in complex and dynamic environments, drastically reducing the need for human intervention and reducing the need for large manpower deployments.

The TheMIS UGV is part of robotics programs in 16 different countries internationally, eight of which are members of NATO, including Estonia, France, Germany, the Netherlands, Norway, Spain, the UK, and the US.

At DSA, the TheMIS Cargo can be found in the UAE Pavilion in hall 3, stand 3900.

Milrem Robotics is the leading European robotics and autonomous systems developer and systems integrator, with offices in Estonia, Finland, Sweden, the Netherlands, and the US. The company is known for their TheMIS and Multiscope UGVs, the Type-X Robotic Combat Vehicle and MIFIK. ■

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Boeing Delivers First CH-47F Block II Chinook Aircraft to U.S. Army

In support of ongoing U.S. Army modernization efforts, Boeing delivered the first CH-47F Block II Chinook. The aircraft is one of up to 465 in the Army's fleet that will be modernized to the new Block II configuration.

"The CH-47F Block II provides capability improvements allowing the U.S. Army to lift more, fly farther and maintain their aircraft better than ever before," said Heather McBryan, vice president and program manager, Cargo Programs. "This modernization program enables the battle-tested Chinook to play a key role in multi-domain operations going forward."

With an improved drivetrain, a reinforced airframe and enhanced fuel system, the CH-47F Block II provides for an additional 4,000 pounds of max gross weight and extends the mission radius for nearly all payloads. In addition to the capability improvements, the aircraft's design enables future technology upgrades.

Additionally, the company's Block II program improves aircraft sustainment. The improved reliability of the new rotor system minimizes unscheduled maintenance, and the simplified fuel



system drives sustainment efficiency reducing maintenance burden and cost. "As the Army's Heavy Lift platform of tomorrow, the CH-47F Block II provides increased capability while continuing

support of the Army's requirement to remain strategically responsive across the full spectrum of operations," said Ms. Viva Kelly, U.S. Army Cargo Helicopters acting project manager. ■

Liebherr hits Major Milestone in Additive Manufacturing

Liebherr-Aerospace has made the next major step regarding additive manufacturing of parts with increased complexity for aerospace application. The first-tier supplier has successfully integrated a 3D-printed flex shaft in the Airbus A350 high lift system. The unit has been approved by Airbus as well as by the European Union Aviation Safety Agency EASA for serial production.

Liebherr-Aerospace continues to consistently pursue its path in the 3D printing sector. The company has now celebrated a new milestone: a flex shaft, a component with an increased degree of complexity and produced from titanium powder using Additive Layer Manufacturing (ALM), has successfully made its way into aviation. Aircraft manufacturer Airbus as well as EASA, have both approved the flex shaft to enter series



production.

Based on the new design options that ALM is offering, Liebherr was able to replace the assembly of seven parts, formerly conventionally manufactured, by just one single 3D-printed component. The lower number in parts leads to improved reliability and significant weight reduction. Compared to the 3D-printed parts previously developed and manufactured by Liebherr, the flex shaft has a higher complexity and represents a next step towards applications in highly integrated systems.

The flex shaft is part of the Airbus A350 high lift system, where it will be integrated in the active differential gearbox of the flap system. The flex shaft transmits the rotary movement to a position sensor and thus compensates for an angle and axis misalignment between gearbox and sensor.

An impressive range of 3D-printed products by Liebherr-Aerospace The solution provider Liebherr-Aerospace can already look back at quite a range of its products manufactured by ALM. At the beginning of 2019, for example, Liebherr-Aerospace started the serial production of 3D printed parts with the introduction of a printed proximity sensor bracket for the A350 nose landing gear. This bracket was the first-ever introduced Airbus system part qualified for titanium additive layer manufacturing. ■

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AirAsia Elevates Cinema Experience with “Cinematic In-Flight” Innovation Across India

AirAsia, recognized as the World’s Best Low Cost Airline for the 15th consecutive year, is set to enhance the movie-going experience across India with its innovative “cinematic in-flight” initiative. This move comes as the airline expands its robust network, connecting 16 cities in India to over 130 destinations via Malaysia and Thailand.

AirAsia will introduce this unique experience in 130 cinemas across 12 cities in India over the next six months. Movie-goers will have the chance to not only enjoy captivating films but also participate in contests to win flights to any destination within AirAsia’s extensive network. This collaboration aims to showcase AirAsia’s diverse destinations, spanning bustling cities, serene beaches, historic landmarks, and vibrant local cultures.

In 2024, AirAsia has significantly expanded its routes from India, offering direct connectivity to Kuala Lumpur and Bangkok as gateways to global destinations. The airline operates over 20 daily flights across 16 cities in India and plans to launch new routes from Guwahati, Kozhikode, Lucknow to Kuala Lumpur, and Tiruchirapalli to Bangkok.

Recently adding routes to Almaty and Nairobi, AirAsia continues to provide affordable connections from Asia to new vibrant destinations via Kuala Lumpur. The

airline’s commitment to service excellence and affordability was underscored by winning the prestigious World’s Best Low Cost Airline and Best Low Cost Airline in Asia awards at the Skytrax World Airline Awards 2024.

Paul Carroll, Chief Commercial Officer of AirAsia, emphasized that India remains a key growth market for AirAsia, supported by our expanding network and fleet growth post-pandemic. “Our efforts in India reflect AirAsia’s long-term vision of recognizing the country as a key growth market and advancing its aviation ecosystem. Through our global network, we will continue to support India’s tourism industry by promoting its travel gems to the world, leveraging the government’s free visa initiatives.

“Today, we are excited to unveil an innovative partnership with Qube Cinemas, a leader in digital cinema technology to elevate AirAsia’s brand presence in the market.

Soon, the immersive AirAsia ‘cinematic in-flight’ experience will be in 130 cinemas across India for 6 months and we’re really looking forward to connecting more meaningfully with movie-goers who are also travel lovers here through this initiative,” he said.

Juhi Ravindranath, Chief Business Officer of Qube Cinemas, commented, “In India,

cinema is one of the best avenues for any brand to reach mass audiences and create a deep impact. The medium influences many aspects of our people’s lives including fashion, lifestyle, and pop culture. The AirAsia team saw merit in the power of this medium and enthusiastically collaborated with us to create this cinematic in-flight experience.

We are certain that this will appeal to movie buffs of all age groups and build momentum for the brand. The entire team at Qube Cinema feels thrilled to enable this campaign across its network screens and can’t wait to see the delight among audiences.”

Since its inception in 2001, AirAsia has grown from a small fleet to one of the largest low-cost carriers globally, pioneering affordable flying and expanding connectivity across the Asia-Pacific region. The airline continues to prioritize safety, service excellence, and innovation, complemented by a comprehensive ecosystem of engineering services, in-flight offerings, and ground operations.

As AirAsia looks ahead, its commitment to enhancing customer experiences through innovative initiatives like the “cinematic in-flight” experience reaffirms its position as a leader in the aviation industry, connecting continents and cultures with every flight. ■



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Indian Air Force Contingent Participates in Ex Pitch Black 2024



An Indian Air Force (IAF) contingent landed at the Royal Australian Air Force (RAAF) Base in Darwin, Australia to participate in Exercise Pitch Black 2024. The exercise is scheduled to be conducted from 12th July to 02nd August. This biennial, multi-national exercise is hosted by the RAAF. The name 'Pitch Black' was derived from the emphasis on nighttime flying over large unpopulated areas.

This edition is slated to be the largest in the 43-year-long history of Ex Pitch Black, which includes participation by 20 countries, with over 140 aircraft and 4400 military personnel of various air forces. The exercise will focus on Large Force Employment warfare aimed at strengthening international cooperation and shall facilitate experience enhancement with the IAF Su-30 MKI operating alongside the F-35, F-22, F-18,

F-15, Gripen, and Typhoon fighter aircraft.

The IAF contingent comprises over 150 highly skilled Air Warriors including pilots, engineers, technicians, controllers, and other subject matter experts, who will be operating the formidable Su-30 MKI multirole fighters, with the C-17 Globemaster and the IL-78 Air-to-Air Refuelling aircraft in combat enabling roles. The exercise would provide IAF with an opportunity to force integration with participating nations and mutual exchange of best practices.

The exercise provides an excellent opportunity for strengthening the ability of the participating nations to deploy over large distances, support integrated operations in the Indo-Pacific region, and build strong aviation associations in a highly challenging environment. The IAF has previously participated in the 2018 and 2022 editions of this exercise. ■



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EDGE Group and KNDS to Collaborate in the Land Defence Domain



EDGE, one of the world's leading advanced technology and defence groups, today announced a cooperation agreement with KNDS, Europe's leading manufacturer of military land systems, at Eurosatory 2024 in Paris, France, to develop industrial and

commercial relations in the field of land defence.

The partnership aims to enhance the collaborative efforts between EDGE Group and KNDS in several key areas of land defence, including the co-development and co-production of munitions and

weapons systems. By combining the mutual expertise and technological advancements of both organisations, the partnership seeks to deliver state-of-the-art defence solutions to support the work of the UAE armed forces and partner countries of France and the UAE. ■



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