

Click here or visit www.epicos.com

Volume 8 Number 26 - Wednesday, 29 June 2016

Part I: Oman	
1.	Oman: Defence Budget and Military Capabilities
2.	Oman: Defence Industry, Technological Level and Opportunities for International Cooperation
3.	Epicos "Industrial Cooperation and Offset Projects"
4.	Development of a customized Howitzer crew training and simulation system
5.	Semi-inertial navigation system to be installed on-board tactical military armoured and utility vehicles
6.	News from our A&D Business Network
Part II: Epicos Newsroom	
1.	AJAX programme completes initial air portability trials
2.	Hibernia Project, RDC and CAE inaugurate the New Helicopter Training and R&D Centre in Newfoundland and Labrador
3.	AUSTAL Delivers Seventh Expeditionary Fast Transport (EPF7) To U.S. Navy
4.	The Falcon 8X receives EASA certification
5.	Orbital ATK and NASA Successfully Complete Ground Test of World's Largest Solid Rocket Motor

Oman: Defence Budget and Military Capabilities



According to Oman's 2016 budget, spending on defence and national security has declined by 300 million riyal (approximately 780 million US dollars), reaching 3.5 billion riyal (approximately 9

billion US dollars). This should be largely attributed to the following oil prices, as Oman is heavily dependent on oil to fund its national budgets. However, the Gulf Cooperation Council (GCC) takes security seriously, something that is partly reflecting regional geopolitical challenges. It is indicative that defence and security absorbs approximately 28% of the total allocated expenditures. It should be noted here that the defence and security expenses are allocated under one item, including current, capital and construction expenses, as Omani authorities release only an aggregate figure, while no further details on defence spending are available.



Source: Combined data from: Oman Arab Bank, Oman Budget 2016 & Sultanate of Oman, Ministry of Finance 2015, Guide to Reading the State's General Budget

Oman maintains an army of approximately 45,000-person, one of the largest and best trained in the region. However it is also one of the least well equipped. Due to Oman's historic ties with the British military, Omani army is mainly equipped with British-made equipment. This close defence relationship, was reaffirmed in March 2016, when British defence Secretary Mr. Michael Fallon announced the intent to develop a joint venture between British defence company Babcock International and the Oman Drydock Company, which will help Oman to turn its new Duqm port into an international naval support centre.

Additionally, British company BAE Systems will supply 12 Typhoon and 8 Hawk Advanced Jet Trainer (AJT) aircraft to the Royal Air Force of Oman (RAFO), along with in-service support to its operational tasks. Deliveries will commence in 2017.

Apart from British-made equipment, Oman is also purchasing equipment from the USA. In January, 2014 Raytheon Company has received a direct commercial sales contract from Oman for the National Advanced Surface-to-Air Missile System (NASAMS). The award, valued at \$1.28 billion, includes ground support equipment, a full training package, and technical assistance.

© Epicos Informational Services

As it is already mentioned, Omani army is one of the least well-equipped in the region. One of the reasons is the limited funds Oman allocates in defence and security. However, the GCC country has received small amounts of Foreign Military Financing (FMF) from US that have been used to purchase US-made equipment, in order to expand and modernize its arsenal.





Notes: IMET is International Military Education and Training; FMF is Foreign Military Financing; NADR is Nonproliferation, Anti-Terrorism, De-Mining and Related Programs, and includes ATA (Anti-Terrorism Assistance); EXBS (Export Control and Relate

The Royal Navy of Oman (RNO) is of strategic importance, mainly due to the fact that the country has to protect its long coast and ports in the Indian Ocean, as well as an important part of the Strait of Hormuz, a vital sea corridor through which most of the region's oil production is shipped to the outside world.

RNO operates, 3 Khareef Class corvettes, which are constructed by BAE Systems Surface Ships. The Khareef Class corvettes are equipped to defend against both surface and air threats with stealth features to operate undetected, an innovative hull design and electric propulsion. The ship is capable of undertaking a range of operations including coastal patrols, disaster relief, search and rescue, and deterrence operations.

Additionally, in January 2016, Singapore Technologies Marine Ltd. (ST Marine), the marine arm of Singapore Technologies Engineering Ltd. (ST Engineering), held the interim delivery and acceptance ceremony for the third Patrol Vessel (PV) and the naming ceremony for the fourth PV built for RNO. The contract for the design and build of the four Al-Ofouq class of PVs was awarded by the Omani Ministry of Defence in April 2012. With a total value of €534.8m, this was the largest defence export contract in ST Engineering's history.

Finally, RNO purchased 2 High Speed Support Vessels (HSSVs) from the Australian-based global ship building company Austal. The value of the contract is approximately US\$124.9 million. In May 2016 RNO has officially taken delivery of the first of the two HSSVs.

Kyriazis Vasileios

Epicos Newsletter Head Editor

Oman: Defence Industry, Technological Level and Opportunities for International Cooperation





The Gulf Cooperation Council countries – Bahrain, Kuwait,

Oman, Qatar, Saudi Arabia and the United Arab Emirates – allocate a significant amount of their budgets to defence. The real significance of this fact goes beyond their massive spending as it signals a unique growth opportunity for the

region's defence industry through the implementation of the offset agreements generated by the purchase of defence equipment from foreign countries. Considering that roughly 30% of these funds are dedicated to capital expenditure, we can estimate that a rather huge amount of money can be redirected to the local economies (through offsets) in order to further ameliorate their performance. Oman is not an exception, as it makes considerable efforts for the enhancement of its defence industry through offsets.

Currently, indigenous defence industrial capabilities are rather limited. Nevertheless, there are some companies in the country that manufacture and/or provide products and/or services to the defence industry. The country has domestic capacity to produce ammunition through the Oman Munitions Company (OMC). It should be noted here that the principal local industrial asset remains the Engine Engineering Co., producer of the NIMER III Light Armored Vehicle.

As it is already mentioned, Oman has a unique opportunity to enhance the technological level of its local defence industry through offsets. In 2015, Omani Authority for Partnership for Development (OAPFD) signed several Partnership for Development (PFD) agreements with foreign companies. Nevertheless, offset has provided opportunities for the country, for several years. In November 2000, BAE Systems and the Government of Oman opened the Oman Aircraft Control College, a joint civil and military air traffic control training facility located in Muscat.

Another initiative established through the PFD program is the Oman Aviation Academy Project (OAA) the aim of which is to create a regional Aviation Academy for the training of pilots. The project is developed in collaboration with Airbus Helicopters and their technical partner ENAC (Ecole Nationale de l'Aviation Civile).

Towards this direction, Oman is planning to further exploit opportunities in order to assist the establishment of a viable defence industry. In order to achieve this, the GCC country could promote the creation of cooperative schemes with foreign partners, as well as to try to intensify its R&D efforts and to link them with commercial opportunities as well as with the needs of the local armed forces.

Kyriazis Vasileios

Epicos Newsletter Head Editor

Epicos "Industrial Cooperation and Offset Projects"

epicos.com Epicos "Industrial Cooperation and Offset Projects" provides a unique set of online tools enabling the structure, identification and implementation of comprehensive Offsets programs, through a searchable database. By introducing different offset projects and ideas proposed by local A&D industry it ensures the optimum cost for Prime Contractors and reassures that the priorities of local industry are fully met...

For Further Information Press Here

Development of a customized Howitzer crew training and simulation system



A leading player in artillery simulation and training concepts is interested in expanding its Howitzer crew training and simulation system into new markets. The complete training system is a proven concept, which uses a complete turret with all equipment, dummy ammunition and monitoring systems for the instructors to make sure that artillery training can be performed as realistic as possible. The system simulates the whole firing process and is considered to be much more cost effective than training in the real environment. Having delivered more than 50 systems to 10

international customers worldwide, the company has established the market leadership in this field. The company is interested in expanding this leadership and extend its customer base to new countries. In this context, the company is willing to cooperate with a prime contractor to develop a customised Howitzer training system, which can be offered to a third country as part of a direct or indirect offset programme.

For Further Information Contact our ICO Department

Mail at: a-kintis@epicos.com

Semi-inertial navigation system to be installed on-board tactical military armoured and utility vehicles



A company with long standing experience in the development and production of electromechanical instruments and avionics systems, is proposing the installation of a semi-inertial navigation system on tactical armoured vehicles. The system will provide low cost and adequate accuracy for ground vehicles, improving situation awareness, while at the same time promote the integration of almost all types of vehicles in a common information network. The potential utilization of existing know-how in the field of land

vehicle navigation in order to fulfil related navigation requirements of future soldier systems (in a miniaturised version), is also proposed as part of the project.

For Further Information Contact our ICO Department

Mail at: a-kintis@epicos.com

News from our A&D Business Network



Air Canada and Bombardier Finalize Landmark C Series Order for up to 75 Aircraft



Bombardier Commercial Aircraft and Air Canada announced today that they have finalized a firm purchase agreement consistent with the Letter of Intent (LOI)

announced in February 2016. The purchase agreement includes a firm order for 45 CS300 aircraft and options for an additional 30 CS300 aircraft. "I'm pleased to officially welcome Air Canada to our CS300 family of operators as one of our largest customers and early adopters," said Alain Bellemare, President and Chief Executive Officer, Bombardier Inc. "As an innovative operator, admired for successfully reinventing itself and, like Bombardier based in Québec, Air Canada and the C Series aircraft are a perfect match.

"This order is a major statement of support for Canada's aerospace industry and will help support thousands of C Series related jobs," Mr. Bellemare continued. "It also serves as an important catalyst for renewed interest and subsequent orders."

"Over the past few years, we've been making transformative moves to boost our competitiveness and customer satisfaction to better position us for growth and continued success. Finalizing the CS300 order is a key element to Air Canada's strategy to build one of the world's youngest and most fuel efficient fleets," said Calin Rovinescu, President and Chief Executive Officer, Air Canada. "This order also will help establish a Centre of Excellence for C Series maintenance work in Québec. Following a rigorous evaluation of its capabilities, we're confident that the C Series aircraft's superior range, economics and seating capacity will provide a stellar passenger experience and contribute significantly to our development plans to expand our network and increase point-to-point service to Canadian and transborder markets."

Deliveries are scheduled to begin in late 2019 and extend to 2022. At list price, the firm order for 45 CS300 aircraft is valued at approximately \$US 3.8 billion. This amount would increase to \$US 6.3 billion should Air Canada exercise all 30 option aircraft.

"We are proud to have Air Canada, one of the world's most respected airlines, as a C Series customer and look forward to building upon our long-standing partnership," said Fred Cromer, President, Bombardier Commercial Aircraft. "Finalizing this order ensures the strong momentum we've achieved with the C Series continues and further highlights the tremendous value the aircraft provides to our airline customers."

About C Series Aircraft

The C Series family of aircraft, representing the fusion of performance and technology, is a 100 per cent all-new design that offers operators up to US \$13 million extra value per aircraft.

By focusing on the 100- to 150-seat market segment, Bombardier has designed the C Series aircraft to deliver unparalleled economic advantage to operators and to open up new opportunities for single-aisle aircraft operations.

By employing advanced materials, state-of-the-art technologies and advanced aerodynamics, combined with the groundbreaking Pratt & Whitney PurePower[®] PW1500G engine, the C Series aircraft is delivering a greater-than 10 per cent unit cost advantage compared to similarly-sized, reengined aircraft.

In addition to delivering best-in-class economics with the C Series aircraft, Bombardier has placed considerable emphasis on cabin design to ensure a superior passenger experience. The aircraft offers 19-inch-wide seats that set a new industry standard, large overhead bins that accommodate a carry-on bag for each passenger, and the largest windows in the single-aisle market. Together, these attributes create a widebody feel that offers passengers an unparalleled level of comfort.

The game-changing C Series aircraft offers the best-in-class environmental scorecard and is the quietest in-production commercial jet in its class. With a combination of outstanding short-field capability and a maximum range of up to 3,300 NM (6,112 km), the C Series aircraft is uniquely positioned for varied types of operations.

For Further Information Click Here

US Navy Awards Harris Corporation \$27 Million Order for Electronic Warfare Decoy Technology



Harris Corporation has received a \$27 million order to deliver maritime electronic warfare (EW) payloads for the U.S. Naval Research Laboratory's Advanced Decoy Architecture Project (ADAP) program. The order was

received during the fourth quarter of Harris' fiscal 2016. The order, issued under a threeyear, \$54 million ceiling IDIQ contract received in September 2015, also includes testing and engineering services to help meet current and future EW mission requirements. The Harrisdeveloped ADAP EW payloads represent an upgrade to the existing Nulka decoy, currently in service with the U.S. Navy, Coast Guard, Royal Australian Navy and Royal Canadian Navy.

"Decoys are an essential layer of shipboard protection, often serving as the last line of electronic defense," said Ed Zoiss, president, Harris Electronic Systems. "Harris ADAP payloads defeat the most sophisticated RF-guided anti-ship weapons with electronic techniques built upon decades of electronic warfare and countermeasure design experience."

About Harris Corporation

Harris Corporation is a leading technology innovator, solving our customers' toughest mission-critical challenges by providing solutions that connect, inform and protect. Harris supports customers in more than 125 countries, has approximately \$8 billion in annual revenue and 22,000 employees worldwide. The company is organized into four business segments: Communication Systems, Space and Intelligence Systems, Electronic Systems, and Critical Networks. Learn more at <u>harris.com</u>.

Epicos NewsRoom

AJAX programme completes initial air portability trials

General Dynamics Land Systems-UK has completed initial air portability trials for the AJAX family of vehicles at the Joint Air Delivery Test and Evaluation Unit (JADTEU) at Royal Air Force (RAF) Brize Norton. The trials, which took place at the end of May, assessed the loading of the ARES prototype platform, which will be used to deliver and support specialist troops across the battlefield, into the cargo hold of an RAF C-17A Globemaster III and A400M Atlas aircraft. These aircraft provide the RAF with a long-range, strategic, heavy-lift capability, which enables it to project and sustain an effective force close to a potential area of operations for combat, peacekeeping or humanitarian missions worldwide.

The ARES prototype platform was driven onto real-size mock-ups of each aircraft, in order for JADTEU to develop a tie down scheme. These trials form part of the process, which, combined with additional trials, will ensure that the AJAX family of vehicles, when in-service, can be transported anywhere in the world in rapid time to support the British Army.

Chief of Materiel (Land) for the UK's Defence Equipment and Support organisation, Lieutenant General Paul Jaques, said: "AJAX is the biggest armoured vehicle programme for a generation for the British Army. These trials mark significant progress in the programme; it is essential that these fully-digitised fighting vehicles, which will sit at the heart of the UK's agile Strike Brigades, can be deployed at short notice worldwide to protect the UK and our interests."

Kevin Connell, vice president of General Dynamics Land Systems-UK, said: "The AJAX programme continues to make excellent progress during this trials period, with these successful trials following quickly on the back of early live fire trials in April. Thanks to the hard work of the project partners and our supply chain, we have been able to successfully demonstrate that the AJAX family meets a key requirement for air portability."

The range of AJAX variants will allow the British Army to conduct sustained, expeditionary, full-spectrum and network-enabled operations with a reduced logistics footprint. It can operate in combined-arms and multinational situations across a wide-range of future operating environments. The first British Army squadron will be equipped by mid-2019 to allow conversion to begin with a brigade ready to deploy from the end of 2020.

For Further Information Click Here

Source: Epicos, General Dynamics Land Systems-UK

epicos.com

Hibernia Project, RDC and CAE inaugurate the New Helicopter Training and R&D Centre in Newfoundland and Labrador

The Hibernia Management and Development Company Ltd. (HMDC), the Research & Development Corporation (RDC) and CAE today inaugurated a new helicopter training and research and development (R&D) centre in Newfoundland and Labrador. Fully funded by HMDC and RDC, the centre features the first civilian Level D helicopter simulator with night vision in Canada and hosts five research projects.

The centre is operated by CAE, a leading Canadian provider of training and simulation technologies. The simulator provides unprecedented realism for offshore facilities and local weather conditions. HMDC helicopter service provider Cougar Helicopters has started training its pilots at the centre.

"CAE is proud to offer the highest quality flight and mission training to offshore and search and rescue crews in the province, including Cougar Helicopters. We also look forward to the research and development projects aimed at making helicopter training more efficient and safe," said Nick Leontidis, CAE Group President, Civil Aviation Training Solutions, at the inauguration event. "Through this partnership with the Research & Development Corporation, we will develop local R&D expertise to support the needs of the Newfoundland and Labrador oil and gas industry."

"This training and R&D centre creates local jobs, builds local expertise, and supports local research that is specifically designed for our regional environment and our offshore needs," said Len Coughlan of HMDC. "Having this facility in the region increases the level of research related to helicopter operations, which will contribute to improved operations and flight safety."

"This new world-class facility presents an exciting opportunity for increased R&D and collaboration in Newfoundland and Labrador," said the Honourable Christopher Mitchelmore, Minister of Business, Tourism, Culture and Rural Development and Minister Responsible for the Research & Development Corporation. "This investment will focus on human factors research in areas such as aircrew health monitoring and helmet fatigue which are critical operational issues for industry."

"RDC is excited to partner with CAE to enhance R&D capabilities in this industry," said Mark Ploughman, Acting Chief Executive Officer of RDC. "CAE is a recognized global leader in training and with the completion of this new facility, together we are enabling research that will further enhance transportation safety and efficiencies for aircrew and personnel working in Newfoundland and Labrador's offshore industry."

"Cougar Helicopters has very high flight crew training standards for our offshore oil & gas and SAR operations and our pilots train multiple times annually to maintain that standard. This simulator provides training for our low visibility and offshore approaches and simulates turbulence and icing conditions accurately to match the conditions in which we operate," said Hank Williams, Chief Operating Officer of Cougar Helicopters. "A training centre right here in the province provides more efficient scheduling of training, less travelling and therefore less fatigue for our flight crews."

The centre is located in a new building in Mount Pearl, Newfoundland and Labrador, and is already fully operational.

About Hibernia Management and Development Company Ltd.

Hibernia Management and Development Company Ltd. (HMDC) is the operator of the Hibernia field which began petroleum production offshore Newfoundland and Labrador in November 1997. HMDC is owned jointly by ExxonMobil Canada (33.125%), Chevron Canada Resources (26.875%), Suncor Energy (20%), Canada Hibernia Holding Corporation (8.5%), Murphy Oil (6.5%) and Statoil Canada Ltd. (5%). Find out more about HMDC at www.hibernia.ca.

About RDC

RDC is a provincial Crown corporation responsible for improving Newfoundland and Labrador's research and development performance. RDC works with research and development stakeholders including business, academia and government agencies and departments to make strategic investments in highly qualified people, R&D infrastructure and innovative research. Find out more about RDC at <u>www.rdc.org</u> or on Twitter @RDCNL.

About CAE

CAE (NYSE: CAE; TSX: CAE) is a global leader in the delivery of training for civil aviation, defence and security, and healthcare markets. We design and integrate the industry's most comprehensive training solutions, anchored by the knowledge and expertise of our 8,000 employees, our world-leading simulation technologies and a track record of service and technology innovation spanning seven decades. Our global presence is the broadest in the industry, with 160 sites and training locations in more than 35 countries, including our joint venture operations, and the world's largest installed base of flight simulators. Each year, we train more than 120,000 civil and defence crew members, as well as thousands of healthcare professionals. Follow on Twitter @CAE_Inc

Source: Epicos, CAE

AUSTAL Delivers Seventh Expeditionary Fast Transport (EPF7) To U.S. Navy

Austal Limited is pleased to announce the U.S. Navy has accepted delivery of USNS Carson City (EPF 7) from Austal USA, during a ceremony held aboard the ship at Austal USA's shipyard in Mobile, Alabama, USA on 24 June.

This is the second vessel delivered by Austal USA to the U.S. Navy this month.

Austal Chief Executive Officer David Singleton said the delivery of the latest EPF is further evidence of Austal USA's success in efficient, modern shipbuilding and expertise in modular manufacturing.

"Our hard working, highly skilled workforce continues to deliver on this important program, which is redefining naval capability and exceeding stakeholder expectations around the globe."

Three additional EPF remain under construction in Mobile as part of a 10-ship, US\$1.6 billion block- buy contract from the U.S. Navy. The future USNS Yuma (EPF 8) will be christened later this (US) summer and will launch soon after, while modules for the City of Bismarck (EPF 9) are under construction in Austal's module manufacturing facility (MMF). The first aluminium was cut for Burlington (EPF 10) earlier this month and module construction has begun in the MMF.

About Austal

Austal is a global defence prime contractor and a designer and manufacturer of defence and commercial ships. For more than 27 years Austal has been a leader in the design, construction and maintenance of revolutionary ships for governments, navies and ferry operators around the world. More than 255 vessels have been delivered in that time.

For Further Information Click Here

Source: Epicos, Austal

The Falcon 8X receives EASA certification

Dassault Aviation is pleased to announce the certification of the Falcon 8X by the European Aviation Safety Agency (EASA).

This certification is exactly as anticipated in the program schedule. American certification will shortly be issued by the Federal Aviation Administration (FAA). First deliveries of the Falcon 8X will therefore be possible at the beginning of the fourth quarter, as announced when the aircraft was launched in May 2014.

"Not only did we develop a Falcon which is exactly in line with the needs of our customers in terms of range, comfort and operational flexibility, but we also did so in record time and with an unparalleled process to ensure aircraft reliability and maturity", said Eric Trappier, Dassault Aviation Chairman and CEO.

The 26th Falcon 8X is currently in final assembly in the Mérignac plant, while twelve aircraft are in cabin outfitting in the Little Rock plant (Arkansas, United States).

About the Falcon 8X:

Derived from the Falcon 7X, the Falcon 8X first flew on February 6, 2015. It will offer the greatest range and the longest cabin of any Falcon, allowing it to fly passengers comfortably from Beijing to New York, Hong Kong to London or Los Angeles to Moscow nonstop. It will also share the 7X's exceptional operating economy and short-field performance. In addition to the quietest cabin and the most advanced digital flight control system in business aviation, the trijet will feature the largest selection of standard cabin configurations of any large business jet.

About Dassault Aviation:

With more than 8,000 military and civil aircraft delivered to more than 90 countries over the past 60 years, and having logged nearly 28 million flight hours to date, Dassault Aviation can offer recognized know-how and experience in the design, development, sale and support of all types of aircraft, from the Rafale fighter to the Falcon range of high-end business jets, as well as military unmanned air systems. In 2015, Dassault Aviation reported revenues of €4.20 billion. The company has almost 12,000 employees. In 2016, Dassault Aviation is celebrating the first centennial of its history, which started in 1916 with Marcel Dassault and the Éclair propeller.

For Further Information Click Here

Source: Epicos, Dassault Aviation

© Epicos Informational Services

Orbital ATK and NASA Successfully Complete Ground Test of World's Largest Solid Rocket Motor

Orbital ATK, a global leader in aerospace and defense technologies, in partnership with NASA, today successfully completed the second of two booster qualification motor tests (QM-2) for NASA's Space Launch System (SLS). Preliminary data indicate the motor performed well and provided the necessary data toward meeting our test objectives.

Orbital ATK developed the two five-segment rocket boosters for NASA's SLS, a heavy-lift rocket designed to enable exciting new deep space exploration missions. For today's test, Orbital ATK technicians pre-chilled the QM-2 motor over the past month to 40 degrees Fahrenheit in order to test its lower temperature capabilities against the expected temperature range in which SLS may operate. The first qualification motor, QM-1, completed a successful test last spring that validated motor performance at the upper end of the propellant temperature range (90 degrees Fahrenheit).

"The NASA and Orbital ATK team has done an extraordinary job of collaborating to make this test a success," said Charlie Precourt, general manager and vice president of Orbital ATK's Propulsion Systems Division. "SLS is America's rocket, and it is very exciting to know Orbital ATK's boosters will play a big part in launching our astronauts out of Earth's gravity and on to deep space."

Lying horizontally in the test stand, the QM-2 motor is 154 feet in length and 12 feet in diameter and is the world's largest human-rated solid rocket motor in existence. These boosters produce 3.6 million pounds of maximum thrust, more thrust than 14 747-400 jets produce at full takeoff power. The flame exits the motor at Mach 3 and burns for a full 126 seconds. Orbital ATK and NASA will use test measurements from more than 530 data channels to analyze motor performance, acoustics, motor vibrations, nozzle modifications, insulation upgrades, Booster Separation Motor structural dynamic response and nozzle vectoring parameters.

Based on the design heritage of the flight-proven solid rocket boosters used on NASA's Space Shuttle, the SLS five-segment motors incorporate new technologies and updated materials. Orbital ATK is also providing critical propulsion technology for the astronaut safety system aboard the Orion spacecraft, which includes the launch abort motor and attitude control motor. The SLS, along with the Orion spacecraft, provides a flexible deep space exploration platform to take humans and cargo to multiple destinations across our solar system.

"The building blocks for NASA's journey to Mars are in place and are gathering strong momentum," said Precourt, a four-time space shuttle veteran. "I am proud that our company's technology will be a vital part of the SLS program's success and of our team's important contributions to the next chapter in man's exploration of space."

© Epicos Informational Services

The first test flight of SLS and Orion together, called Exploration Mission-1 (EM-1), will be uncrewed and is scheduled for late 2018. During EM-1, SLS will use two of Orbital ATK's five-segment solid rocket boosters. Orbital ATK has 29 key SLS booster suppliers across 16 states including Alabama, Arizona, California, Connecticut, Indiana, Kentucky, Massachusetts, Minnesota, New Jersey, New York, North Carolina, Ohio, Pennsylvania, Texas, Utah and Wisconsin.

About Orbital ATK

Orbital ATK is a global leader in aerospace and defense technologies. The company designs, builds and delivers space, defense and aviation systems for customers around the world, both as a prime contractor and merchant supplier. Its main products include launch vehicles and related propulsion systems; missile products, subsystems and defense electronics; precision weapons, armament systems and ammunition; satellites and associated space components and services; and advanced aerospace structures. Headquartered in Dulles, Virginia, Orbital ATK employs approximately 12,000 people in 18 states across the U.S. and in several international locations. For more information, visit <u>www.orbitalatk.com</u>.

Source: Epicos, Orbital ATK