

DEFENCE TURKEY

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2019

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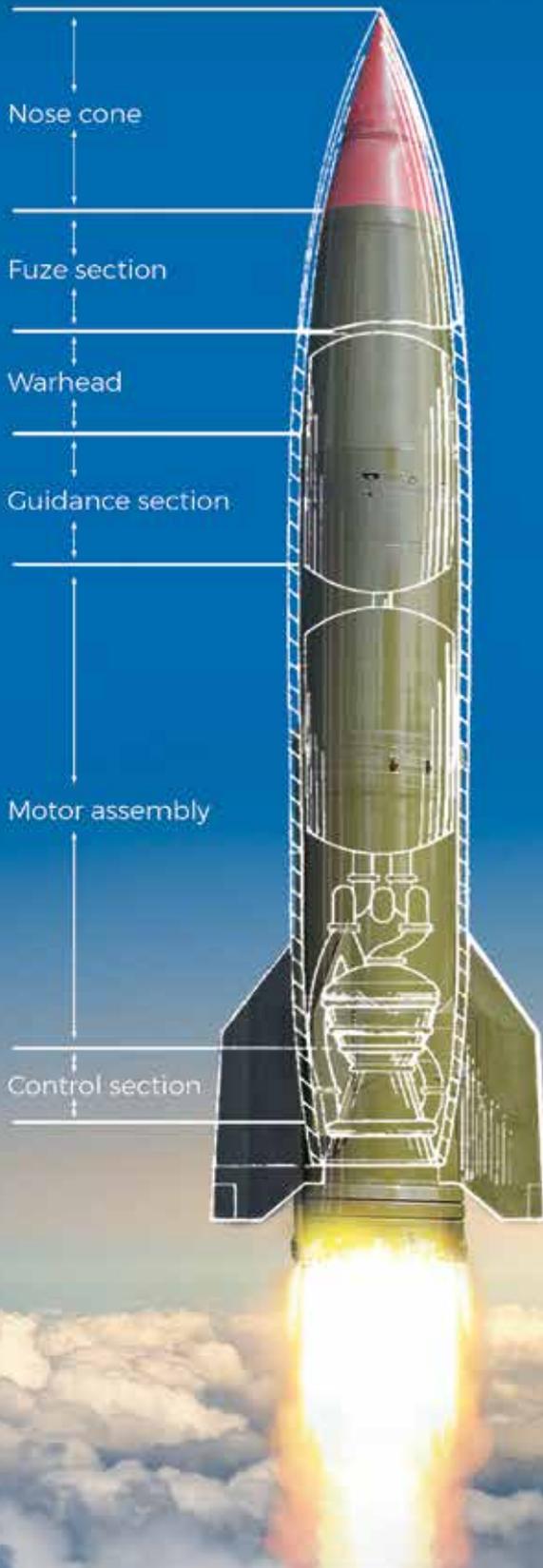
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Publisher

Hatice Ayşe EVERS

Publisher & Editor in Chief

Ayşe EVERS

a.akalin@defence-turkey.com

Managing Editor

Cem AKALIN

cem.akalin@defence-turkey.com

Editor

İbrahim SÜNNETÇİ

ibrahim.sunnetcici@defence-turkey.com

Administrative Coordinator

Yeşim BİLGİNOĞLU YÖRÜK

y.bilginoglu@defence-turkey.com

International Relations Director

Şebnem AKALIN

sebnem.akalin@defence-turkey.com

Turkish Companies Advertisement Director

Yasemin BOLAT YILDIZ

yasemin.yildiz@defence-turkey.com

Translation

Tanyel AKMAN

Saffet UYANIK

info@defence-turkey.com

Editing

Mona Melleberg YÜKSELTÜRK

Robert EVERS

Graphics & Design

Gülsemin BOLAT

Gökem ELMAS

info@defence-turkey.com

Photographer

Sinan Niyazi KUTSAL

Advisory Board

(R) Major General Fahir ALTAN

(R) Navy Captain Zafer BETONER

Prof Dr. Nafiz ALEMDAROĞLU

Cem KOÇ

Asst. Prof. Dr. Altan ÖZKİL

Kaya YAZGAN

Ali KALIPÇI

Zeynep KAREL

DEFENCE TURKEY

Administrative Office

DT Medya LTD.STI

Güneypark Kümeevleri (Sinpaş Altınoran)

Kule 3 No:142

Çankaya Ankara / Turkey

Tel: +90 (312) 447 1320

info@defenceturkey.com

www.defenceturkey.com

Printing

Demir Ofis Kirtasiye

Perpa Ticaret Merkezi B Blok

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Tel: +90 212 222 26 36

demirofiskirtasiye@hotmail.com

www.demirofiskirtasiye.com

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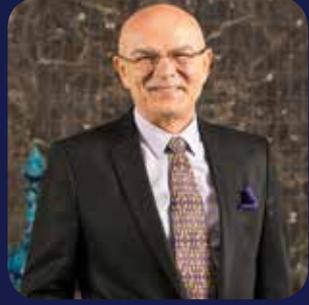
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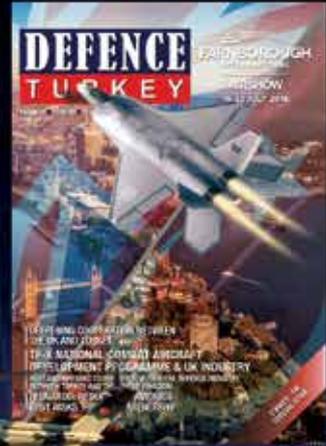
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IDEF Fair Approaching!

Ayşe Evers
Publisher & Editor in Chief

After closing 2018 with a significant increase in domestic and international sales, we said hello to the year 2019 bringing even higher targets with the new products and technologies to be revealed by the Turkish Defence Industry. IDEF International Defence Industry Fair, which takes place every two years in Istanbul, is preparing to open its doors for the nineteenth time this year. Turkish Defence Industry companies are counting the days to showcase their newest products and technologies at the fair to be held once again in TUYAP Congress Center in Istanbul between April 30 and May 3, 2019. The Ministry of National Defence, Turkish Armed Forces, Presidency of Defence Industries, Turkish Armed Forces Foundation, and other institutions and organizations providing support to this event continue their feverish efforts to ensure the fair to be flawless and effective. Our continuously maturing field-proven products, which gained a respectable place in the international markets with their competitive price and superior technology, Turkish Defence Industry Companies, and of course, the IDEF fair, which has a respectable reputation for our country on the international scale, will be exceptional showcases this year.

Our Defence Industry Companies will make their first start in the season before the IDEF fair during IDEX International Defence Exhibition to be held in Abu Dhabi on February 17-21, 2019 with DefenceTurkey magazine as one of the media sponsors. Turkey will participate in the fair under the leadership of Presidency of Defence Industries. A total of twentythree companies covering Aktif Savunma, Ares, Aselsan, Asfat, Ces İleri Kompozit, Desan, Elektroland, FNSS, Garanti Giyim, Global Defence, Gül Otomotiv, Havelsan, MKEK, Nicomatic, Otokar, Repkon, Roketsan, STM, T Kalıp, Transvaro, Unifo Gıda, Yakupoğlu and Yonca Onuk will take place in the IDEX exhibition.

In this issue, we have reviewed the programs carried out by our companies in the MENA region over the last 20 years in our Turkish Defence Industry - MENA Region Countries Market Activities article, which we prepared specially for IDEX exhibition. In addition, honoring us with their interviews in the first issue of the year, I would like to thank TRtest General Manager Bilal AKTAŞ, Chairman of the Board of Canovate Group Can GÜR, CEO of Altay Software Baki ŞENSOY and Femsan General Manager Melih Turan İPEKÇİ once again for their valuable contribution.

Enjoy this issue... ■



Turkey's Transparent and Neutral Testing Solution Partner Equipped to Meet the Needs of Global Clients

TRtest Company- Bilal AKTAŞ General Manager discusses TRtest's new test center, strategy and its solution partners. The company will provide consultancy services, as well as a reliable, accessible and affordable test center. TRtest aims to test the ballistic products to be exported abroad on behalf of the customer country

Defence Turkey: What can you say about the organizational structure, vision, and goals of TRtest which was founded with the aim of establishing, operating, maintaining, and providing training services for conformity assessment infrastructures such as testing, inspection, analysis, demonstration, supervision, certification, calibration, and qualification?

Bilal AKTAŞ: TR Test ve Değerlendirme AŞ, started its activities on November 1, 2018, at the Technopark Ankara campus of İvedik Organized Industrial Zone. It was officially established in December 2017 with the partnership of the Presidency of Defence Industries (SSB), Turkish Standards Institution (TSE), The Scientific and Technological Research Council of Turkey (TÜBİTAK), the Turkish Armed Forces Foundation (TSKGV), and Defence Technologies Center Corp. (STM) in order to coordinate the existing test and evaluation infrastructure and capabilities together with customers by tracking inventories, to contribute to the accomplishment of the testing of critical systems and platforms mainly in the defence industry with domestic and national resources, and to operate test and evaluation infrastructures to be established in our country in a more efficient way. With this in mind, TRtest aims to involve in all the activities in the triangle of products to be tested, test equipment, and technical test personnel. In other words, TRtest will continue its activities by contributing to the design phase of the product to be tested in order to determine the criteria to verify the requirements that will affect the expected performance of the product, specify the technical characteristics for the localization of the equipment to test the product, and to train the technical personnel who will perform the tests.

In short, TRtest set out with the vision of becoming a company that meets the testing needs of national industry within the country and with the aim of being an independent and reliable testing authority with indigenously manufactured equipment for testing high-technology and value-added products.

Defence Turkey: We know that you focused on inventory studies related to the sector in order to better analyze the sector during your time as Head of the Industrialization Department. In this context, have you conducted a classification and inventory study on testing capabilities and test centers within the public, private sector, and universities since taking your new assignment? What is your assessment of the sector regarding the existing testing capabilities?

Bilal AKTAŞ: Yes, between the years 2012-2018, I placed great importance on the effort to create a domestic industry inventory through the industrialization portal and I tried to guide these companies into the defence sector by witnessing the talent of numerous companies on the site. In the same period, together with our production capability inventory study, a test infrastructure inventory study was also conducted for the defence industry under the coordination of the SSB Quality Control-Test and Certification Department.

We are currently carrying out a study to determine the externally-dependent testing capabilities and the existing test infrastructures in the country. Our study will determine the domestic test infrastructures and it is not limited to the testing capabilities of the public sector. We initiated our study at TRtest with reference to the work we conducted with the SSB. First of all, we are in contact with the SSB to update this study. Furthermore, we also identified more than 1,000 test laboratories accredited by TÜRKAK. With the launching of TRtest, test-oriented companies in the private sector have begun to contact us, and we are bringing their talents into our inventory. We now have quite a large portfolio with the defence industry testing inventory, TÜRKAK inventory, testing inventory of the Ministry of Industry and Technology on labs.gov.tr website, including the non-accredited inventories of companies with production-oriented testing capabilities. In the coming days, we will expand and classify this inventory in order to quickly and effectively match the companies need test with test centers. Test capabilities of universities will also be attached into

the our portfolio until the end of this year.

Summarizing the testing capabilities of the sector, except for some platform level tests, we can say that several tests concerning the subsystems can be conducted in the country, however, the links in the test chain which the product should be subjected to have a scattered structure. TRtest, with the National Test Infrastructure Inventory Portal, will enable all the links in the chain to operate in a coordinated manner.

Most importantly, in addition to the test laboratories and centers accredited by TÜRKAK, we are also trying to determine the non-accredited test infrastructures used by our industrialists during their production process. We will integrate our inventory study with the existing test infrastructures at our universities, and I believe that ninety percent of the tests required by the domestic industry can be met in our country.

Defence Turkey: In which areas will TRtest operate? What are your priorities?

Bilal AKTAŞ: One of the main reasons for the establishment of TRtest is that our industry shifted from just manufacturing products to designing them and this led to the creation of data outputs which can be considered private. Therefore, TRtest will play an impartial and a reliable role in managing publicly established test centers primarily and maintaining the data produced in these centers for better designs. For this purpose, as priority test centers, we are working on issues related to the establishment and operation of centers where ballistic products and rocket-missile systems can be tested.

Undoubtedly, TRtest is not merely a defence sector-oriented company. It is also within the mission of TRtest to provide solutions for the testing requirements of the local industry, generally, the civil aviation and transportation sector when it is not possible to meet in the country. Since automotive industry has very crucial role in our industrial sector, Land Vehicle Test Center to be established in Bursa is also in our interest. We have recently finished the feasibility of the Center and we aim to initiate the first phase of the Center within this year. The first way may be started with crash or break runways.

Among our priorities are the efficient use of existing test infrastructures through the portal that we will develop, preventing duplicate test investments, and to manage publicly established new test centers.

Defence Turkey: From your vision, we see that you are aiming to serve as a bridge that builds trust between companies and existing test centers in order to meet the needs of the sector rather than being an investor. Can you explain this in more detail?

Bilal AKTAŞ: Since our domestic industry started to provide products in terms of subsystems for national projects such as ALTAY, ATAK, ANKA, MILGEM, and HISAR after transitioning into designing products from simply manufacturing them, this led to the need of accessing reliable test centers where the companies producing the subsystems would entrust design information of their product. Sometimes, companies are faced with situations where they need to use the testing capabilities of their competitors. Likewise, manufacturing companies with testing capabilities have to test their products in their facilities with their personnel. With its corporate structure and work ethic, TRtest ensures an environment of trust that makes it possible for manufacturers to test their products with a competing company under TRtest personnel responsibility.

Defence Turkey: Do you have any infrastructural studies and marketing activities to present the existing test centers as competitive centers to be preferred by foreign companies in addition to Turkish companies? What is your vision about this?

Bilal AKTAŞ: The capability to carry out tests does not only concern the necessary equipment but also our trained human inventory. Our study on domestic test infrastructure inventory began to mature. Marketing these capabilities abroad is also a part of our vision. In this context, we have contacted certain foreign companies. We discuss joint investments in testing capabilities which Turkey needs as well as marketing of domestic testing capabilities with them. We have test equipment capacity and trained human resources to conduct tests especially in the fields of ballistic protection, textile, and chemical analysis in our country. Regarding the test sites, we have test sites that most



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countries do not have, and I believe that this potential can be marketed abroad.

Defence Turkey: TRtest and test companies sign agreements for the use of test infrastructures. With these agreements, the test companies offer their test infrastructures to the sector under the coordination of TRtest. Can you inform us about the scope and objectives of these agreements? What tests can be carried out under the coordination of TRtest?

Bilal AKTAŞ: We aim to provide the laboratory inventory in Turkey to customers in a fast and reliable way. Environmental tests, fungus test, Electromagnetic interference (EMI) and Electromagnetic Compatibility (EMC) tests and ballistic tests can be carried out under TRtest coordination.

As TRtest we have signed contracts with Nurol Technologies Inc. and Garanti Apparel Composites Technology Industry and Trade Co. Inc. for ballistic tests, Nanobiz Technology Inc. for fungal/antibacterial tests, and Standart Control and Test Services Co. Ltd. and GTL (Global Technology Laboratory) for environmental tests. The aim of these solution partnership agreements is to provide assistance

to the companies responsible for developing products regarding the tests they need to conduct on their products and procedures required by the relevant tests.

Since we believe that private companies test capabilities are our national assets, TRtest will continue to expand strategic cooperation agreements with the private companies. With TRtest and its solution partners, the sector will attain the right consultancy service, as well as a reliable, accessible and affordable test center.

Defence Turkey: There is a small number of Turkish companies involved in the production of test equipment. What are your efforts to increase production, competition, and localization in this regard?

Bilal AKTAŞ: While the share of imported test equipment usage in the market is predominant, the fluctuations in foreign exchange hamper the purchase and production of the equipment. Increasing domestic production gains importance at this point. As TRtest, with the collection of test infrastructure inventory and test manufacturers inventory, we are starting to see more clearly what kind of insufficiencies or duplicities we have on the subject of testing.



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Prof. Hüseyin Avni ÖKTEM - Founder & CTO of Nanobiz Technology INC.; Bilal AKTAŞ - TRtest General Manager and Zeynep ÖKTEM - Founder & CEO of Nanobiz Technology INC

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TULPAR

In order to support the production and use of domestic test equipment, we would like to make recommendations by consulting with the capable companies. Moreover, to support the production of domestic test equipment; there are plans to establish "Test Centers" for the areas that need testing activities and to equip these centers with domestically produced equipment.

We are aware of the importance of using the domestic test infrastructures in an optimized way with the domestic test equipment. In this context, we also visit domestic test equipment manufacturers and note their capabilities. Our inventory studies will continue including the test equipment manufacturers.

Defence Turkey: How do you evaluate the sector in the field of ballistic testing capabilities and centers? It has a significant position in the domestic private sector in this field. In this context, do you have any studies on meeting the domestic and international test requests?

Bilal AKTAŞ: At this stage, for starters, we signed a contract with Nurol Technologies Inc. and Garanti Apparel Composites Technology Industry and Trade Co. Inc. which have TÜRKAK accreditation. According to the contract, the companies in question enable TRtest to manage their ballistic test infrastructures to TRtest within the scope of defence industry projects. We began to carry out tests with our own trained personnel in these facilities. Companies with ballistic test infrastructure provide us with the necessary logistic support and tests are conducted under the supervision of TRtest. We have eliminated dependence on foreign countries in the testing of ballistic vests and helmets. This case was recorded as the first success of TRtest. We are equipped to meet the requests from abroad with a transparent and neutral test service. In particular, as TRtest, we aim to test the ballistic products to be exported abroad on behalf of the customer country.

Defence Turkey: What is your opinion on the Test Ship issue for testing marine subsystems, sonars, and radars? Is there a new project on this in the coming period?

Bilal AKTAŞ: This issue you mentioned is on our agenda. We are conducting various discussions



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with those concerned about how to achieve optimum benefit. The research and studies on this issue are still ongoing. What is important here is to find an answer to the question "whether we need a new test vessel as TRtest or to lease a convenient ship from the inventory?". Our feasibility studies on which is affordable, and maintainability are still ongoing. I believe that we can reach a consensus on common ground with the parties regarding the testing issues within this year.

Defence Turkey: Do you have long-term investment plans?

Bilal AKTAŞ: The establishment and management of the test sites where rocket and missile systems will be tested, the construction of the Land Vehicle Test Center is planned to be established in Bursa, and the establishment and management of the wind tunnel test center are included in our plans. Keeping the

existing test infrastructures accessible and productive, and implementing business models, that the private sector will contribute to as much as possible, are also among our priorities.

Defence Turkey: Finally, is there a message you want to give to our readers?

Bilal AKTAŞ: Our domestic test infrastructure inventory study began to serve the defence industry sector, especially the companies located in Ankara Organized Industrial Zones. Through your magazine, I would like to inform the companies, which could not find a test center to conduct the tests they need, that we can help them to fulfill their test requirements within the country if they submit their test requests via the request form at www.tr-test.com.tr and also I would like to thank you for sparing your time to talk with me about our company, TRtest ■



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Bilal AKTAŞ met up with Cem AKALIN - Managing Editor of Defence Turkey Magazine at TRtest Head Office



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The 39th TOBB Turkish Defence Industry Assembly Meeting Held in Eskisehir

The 39th meeting of the TOBB Turkish Defence Industry Assembly was held on January 28, under the chairmanship of Minister of National Defence Hulusi AKAR at the 1st Air Supply and Maintenance Center in Eskisehir. In addition to the Minister of National Defence, President of Defence Industries Prof. İsmail DEMİR, Deputy Minister of National Defence Muhsin Dere, Eskisehir Governor Özdemir ÇAKAÇAK, President of TOBB M.Rifat HİSARCIKLIOĞLU, 1st Air Supply and Maintenance Center Commander Air Force Brigadier General Gürhan ERGÜRHAN, President of the TOBB Turkish Defence Industry Assembly Yılmaz KÜÇÜKSEYHAN, and a large number of military personnel and representatives of the private sector also participated in the meeting.

Taking the floor at the assembly meeting, President of the TOBB Turkish Defence Industry Assembly Yılmaz KÜÇÜKSEYHAN stated that the sector will continue to grow in the new period without losing speed and that the problems stemmed from the exchange rate in 2018 were met with swift measures taken by KOSGEB as well as the Minister of National Defence, the President of Defence Industries, related institutions, and organizations. KÜÇÜKSEYHAN also stated that Minister of National Defence Hulusi AKAR noted the requests and wishes voiced by the members of the sector at the 38th Assembly consultation meeting held on October 30, 2018, in Kırıkkale: "When we called the relevant departments of the ministry in the afternoon of October 31 regarding the mentioned problems, I learned that they received instructions from you personally and began to work on them. In this respect, we are a very lucky sector. Mr. President, we solve our problems with your direct support and the President of Defence Industries." KÜÇÜKSEYHAN also provided information about the activities carried out since October 30: "In this context; we elaborated on the STANAG documents



(standardization agreements) and provided necessary information. Studies on order quantities for localization and nationalization continue. The Facility Security Clearance and production permit issues were addressed during the study on the controlled materials list which was updated in December 2018. We are also focusing on intellectual property rights and patent issues, in this context, under the auspices of SaSaD and TOBB, a specialist from Sabancı University will provide training on February 11."

Sharing his suggestions with Minister AKAR about the current problems and solutions in the sector, KÜÇÜKSEYHAN stated that the high-interest rates increased the credit, product and service costs for the actors with working capital shortages and thus companies faced with conditions which can cause losses in fixed-price contracts and, as a solution to this issue, they suggested that the payment schedule in the running contracts should be arranged in a balancing way with advance and milestone payments so that the companies do

not need to apply for loans.

HİSARCIKLIOĞLU: "Domestic and national production gained momentum"

TOBB President Rifat HİSARCIKLIOĞLU said that the rate of foreign dependency in the defence industry, which was 80% in 2002, dropped to 35% today and the turnover of the Turkish Aerospace and Defence Industry reached US\$7 Billion.

HİSARCIKLIOĞLU pointed out that four Turkish companies entered the list of the 100 largest companies in the world: "We also progressed in global competition at the same time. Defence industry exports exceeded US\$2 Billion in 2018. We are now exporting UAVs to Ukraine, which produces the world's largest aircraft like Antonov. I am proud of the Ministry of National Defence, the Presidency of Defence Industries, the Turkish General Staff and the defence industry companies for their contribution to this success. Neither the Private sector without public support nor the public without



Yılmaz KÜÇÜKSEYHAN - President of TOBB Defence Industry Assembly gave an presentation to the Minister of National Defence

the determination and diligence of the private sector could have accomplished this success.”

Underlining that the Turkish defence industry has the potential to achieve much more than it has ever done in the fields of production, export and technology development, Rifat HİSARCIKLIOĞLU emphasized that defence industry companies should include SMEs in the production processes to the maximum extent to achieve this. Mr. HİSARCIKLIOĞLU said: “The big actors of the sector and the SMEs positioned around them need to act together. The remarks of Mr. President ‘We will reach our targets in the defence industry with the dynamism of the private sector. We will not import any products from abroad’ created a new enthusiasm and motivation for Turkish companies to increase domestic and national production. Our goal is to turn Turkey into a global actor with advanced technology that it can design and manufacture on its own. I do believe that we will achieve these goals. All we need is to join hands and work together with a shared mindset and consideration.”

HİSARCIKLIOĞLU also stated that the Minister of National Defence Hulusi AKAR had previously gathered with assembly members at the Kırıkkale Ammunition Factory: “We have conveyed the requests of the sector to the Dear Minister in Kırıkkale. Mr. AKAR gave the necessary instructions immediately after the meeting and our problems were solved. STANAG documents (standardization agreements) started to be published on the Ministry’s website. Studies on localization and nationalization were initiated. The facility security clearance and production permits were made easier to obtain. I would like to express our gratitude to Dear Minister for his effective administration which solved the problems of our sector.”

HİSARCIKLIOĞLU concluded his speech by stating that, under the authorization of Minister AKAR, 12 companies signed a Strategic Cooperation Agreement and thus domestic and national production gained new momentum.

Minister of National Defence Hulusi AKAR: “Our F-35 Aircraft will be Maintained at the 1st Air Supply and Maintenance Center”



Indicating that when Turkey receives ownership of the F-35 planes we will have more than 100 aircraft and the supply & maintenance of the aircraft will be carried out here, where they came together today the 1st Air Supply and Maintenance Center, Minister of National Defence Hulusi AKAR made the following statement: “We have a promising situation right now. By providing all the assistance we can, we will raise our industry to a much more advanced level and breath a sigh of relief. When we receive the property of our F-35 aircraft, we will then have more than 100 aircraft. The supply & maintenance of the aircraft will be carried out at the 1st Air Supply and Maintenance Center. We are still working on this, so far we have conducted a fair amount of successful activities in all our factories. We will do better than what we’ve accomplished. We will overcome our shortcomings, correct our mistakes and will be open to consultation, discussion and suggestion. Without losing any time, we need to develop strategies and make plans with a solid understanding in the medium and long term and we need to take firm steps forward with confidence.”

AKAR: “Exports should be the main focus of producing goods and services”

Noting that the defence industry needs to work on high-technology projects, Minister AKAR stated that the sector should use its current potential: “If the defence industry organizes its plans only for the domestic market, this will cause contractions and difficulties after a certain period of time. The defence industry should be based on high-technology. Exports should be the main focus of producing goods and services. While the total turnover of the aerospace and defence industry was US\$3 Billion in 2009, it exceeded US\$7 Billion in end of the year 2018. The exports initially amounted to US\$781 Million, but today has risen to US\$2.5 billion. Moreover, the number of projects reached 640 from the previous year’s 194 projects. These are not the figures that will satisfy us, but it shows that we are on the right track and the tip of the vector is pointing upward. We will continue to work relentlessly with perseverance and determination.”

Following the speeches, the meeting continued with a Q&A session which was closed to the press.





Canovate Group Contributes to Essential Defence Industry Projects

With 40 years of knowledge and experience, Canovate Group will further contribute to the critical technologies required by the Turkish defence industry with local capabilities

“ Aiming to transfer its 40 years of knowledge and experience to projects related to national security, Canovate Group has made significant investments in technologies that can be used in Turkey’s border security projects. After a 3-year period of R&D focus, the company revealed Turkey’s first electro-optical radar “PanTher Radar” which is to be used along the border, at airports, in areas with special security requirements, and ports, etc. Similarly, the “DragonFly” color night vision camera was developed for the protection and surveillance of critical facilities and the “Thermal Radar” which provides 360-degree panoramic observation capability and was developed with the support of TÜBİTAK 1501, are included among the electro-optical products that can be used within the scope of country security. The company also conducts studies on technologies which are necessary and also complementary systems for perimeter security and facility safety such as underground acoustic sensors, acoustic detectors, and Terahertz scanners at its R&D center located in the Istanbul Çekmeköy factory. Defence Turkey Magazine had an opportunity to learn first-hand about the successes and future roadmap of the company during an exclusive interview with Mr. Can GÜR, Chairman of the Board of Canovate Group, which is proud to serve its country by relaying its 40 years of R&D experience and capabilities into the defence industry. ”

Defence Turkey: First of all, can you introduce yourself and also inform us about the structure

and the development of Canovate since its establishment regarding its success in having become one of the top 10 global companies based on technology and product portfolio with its fiber-optic infrastructures and complete data center solutions?

Can GÜR: After graduating from Middle East Technical University (METU) Physics Department in 1975 and Electrical and Electronics Engineering Department a year later, I completed my MS degree in Electronics Engineering in England and returned to my country. Then, I served as an R&D engineer at Gölcük Naval Research Center during my military service, and I was part of the team that re-made the printed circuit boards (PCB) of radar, sonar, and fire control systems. I witnessed how strategically important some of these projects were in those years. In 1979, I founded our company with my brother Özcan GÜR, who is an engineer like me. After establishing our company, we developed the first ‘digital reactive power factor meter’ in the world. The ‘Europe Electronic Product News’ magazine reported our product as the first product from Turkey. We received great demand for this product and started to export it to 60 countries. Because our product was thirty percent more economical than analog devices, and thanks to its digital technology, it had a much more precise measurement capability. In 1986, we started businesses with foreign companies in the field of electronic components to become their distributors in Turkey. We took over the Ümraniye facilities of Alcatel Teletaş, which was closed in 1996, together with its employees, we wanted the domestic industry to continue production. We started to produce digital plants, radio-links and pay phones with a capacity of 4.5 million subscribers to Türk Telekom. However, during the 2001 economic crisis, Türk Telekom’s decision to stop the purchase of fixed-line telephone exchanges caused us to lose a significant portion of our market share. At that time, we decided to develop and produce our own indigenous products. We chose two core technologies for our company. One of these was the data centers,

and the other was fiber-optic infrastructure systems. Foreseeing that these systems will be the dominant technologies in the next 25 years, we decided to design, develop and manufacture our own indigenous products in this field. We invested more than US\$25 Million in R&D since 2001. In short, our company, which we established in 1979 with zero capital, today, is ranked 6th in data centers and 8th in fiber-optic systems among the largest global companies in terms of technology and portfolio. We have managed to be ranked among the top 10 global brands. We have offices and representative offices in several countries, and we export to 72 countries in 4 continents. We export our data centers to various countries such as Austria, Denmark, Spain, Saudi Arabia, Oman, the Philippines, Nigeria, Ethiopia, and Sudan also we continue to export our end-to-end fiber-optic products to several countries such as Germany, France, Netherlands, America, Chile, Saudi Arabia, Ethiopia, Indonesia, Morocco, and Algeria. In our sector, we have international certificates such as UL, ETL, CSA, DELTA, GOST, CE, TUV, TSE, ISO 9001, ISO 14001, OHSAS 180001, and ISO 27001. Vice Chairman of the Board and my son, Cem GÜR has made great contributions to our success in global markets. While conducting and directing data center and fiber optic R&D activities, Mr. Cem GÜR also participated intensively in the sales and marketing activities that we carried out around the world. At the same time, with a patent case filed by the world’s leading rival brands in Europe, we are the first 100% Turkish capital high-tech brand to win a million-dollar patent lawsuit in European Patent Courts as a result of the legal struggle of Mr. Cem GÜR for 1.5 years. In short, Canovate Group is one of the world’s leading R&D and innovation-oriented companies. As a 100% Turkish company, we continue to develop high technology products by carrying out various R&D projects in the fields of information, telecom, the defence industry, ballistic systems, electro-optic systems, and heating/cooling. Since the first day in my 40-year professional life, I have always invested in R&D and

innovation. We always remember how much our investments in R&D and innovation contributed to the success that we have achieved in global markets. With over one thousand employees including an engineering team of more than 100 personnel at our premises on an area of 30 thousand m² in Istanbul Cekmekoy, we continue to develop and produce high technology products in the fields in which we operate.

Defence Turkey: What can you say about the production areas, products, and capabilities of Canovate Group companies? When did you start to work in the defence industry?

Can GÜR: I would like to give information about the companies under Canovate Group and their fields of activity.

Canovate Electronics: It operates in 4 continents among the top 10 global companies with end-to-end Fiber Optic Infrastructures and Data Centers Solutions. The company exports 70% of its production to 72 countries and has offices in the USA, Dubai, Colombia, Argentina, Saudi Arabia, Morocco, Indonesia, and the Philippines. Moreover, it has invested nearly US\$25 million in R&D in 17 years. Within the scope of IoT (Internet of Things) systems R&D and development activities, the company completed the production of IP-PDU (Power Distribution Unit), IP based environment monitoring systems, IP based access control units, IP based modular fire extinguishing systems. It also provides micro, mini, and mobile Data Center solutions, and its Integrated Data Center solution, ITerra DC is currently available.

Canovate Ballistic Systems: It manufactures bulletproof vests, floating bulletproof vests, ballistic shields, ballistic blankets, other ballistic armor, and PanTher Radar (electro-optical radar), DragonFly (color night vision camera), Hyperbolic thermal radar products. THZ imaging system (with TÜBİTAK Support): Passive Terahertz scanners, Active millimeter wave imaging systems are also produced. A company which was established by British Aerospace (now BAE Systems) in the UK with 40 years of bulletproof vests and ballistics manufacturing experience and certifications was bought and then started its activities as a Canovate Group company in Turkey.



Canovate High Tecnology:

It operates in the fields of urban safety management systems (Turkey Urban Safety Management System under ASELSAN leadership-KGYS), Borderline and critical infrastructure security systems, Face recognition technology, Virtual tactical training simulators for military and police, Turkey E-Agriculture project, Signal acquisition and processing technologies, Thermal radar, Cameras and integrated security systems, and Geographic location (geolocation) detection technologies.

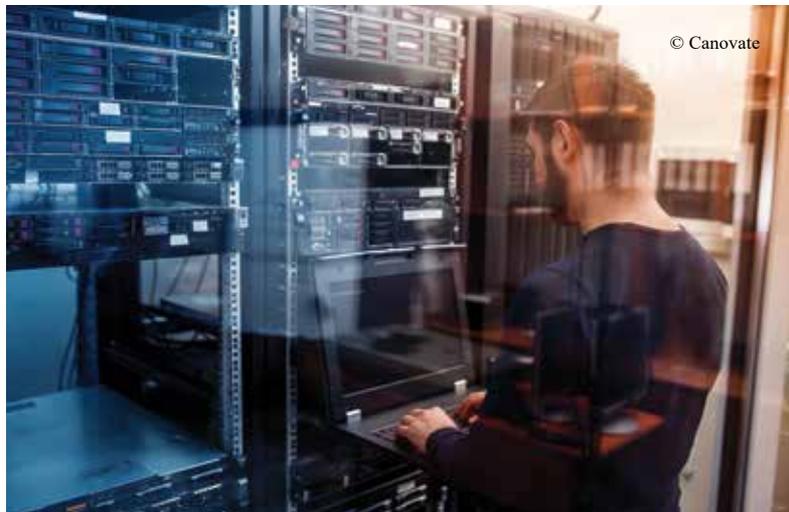
Can Aero: It assembles drones for armed forces and produces professional industrial drones such as "Spider" and "Octopus" with Thermal camera for police and military use, Terahertz scanner, face-recognition, IMSI-catcher (international mobile subscriber identity), and emergency first aid kit, and also manufactures drones for agricultural pesticides, fertilization and crop management including

CBRN (Chemical, Biological, Radiological, Nuclear) disinfectant spraying drones.

Canovate Energy Systems: It manufactures heating, cooling, and air conditioning systems, Precision air conditioners, chiller systems, Indirect adiabatic cooling systems (IAC - Up to 10 times more efficient than normal air conditioners) and also develops and produces Turkey's first and only ground, water, and air source heat pumps and exports various products to several countries.

Canesis System Integration:

Canesis System Integration performs data center and IT network infrastructure integration especially for public institutions and international organizations. Canesis System carries out the SSB data center, UAV data center, and the TNP (Turkish National Police) business continuity and disaster recovery data center project with STM.



Canpark AVM: Canpark project includes Canpark Shopping Mall and Hilton Garden Inn Canpark Ümraniye Hotel. Canpark AVM continues to be the preferred choice of visitors with its 40 thousand m² of rentable area, 150 world's leading brands appealing to every level of society, rich restaurant options with 80 different cuisines, 12 VIP movie theaters equipped with the latest technology Dolby Atmos sound system, 10-line bowling alley and over 5 thousand m² of amusement park. Canpark Shopping Mall is easily accessible with a direct connection from the Yamanevler station of Üsküdar-Sancaktepe Subway Line to the shopping center.

Hilton Garden Inn Canpark Ümraniye (İstanbul): Hilton Garden Inn Canpark Ümraniye, designed as part of Canpark Shopping Mall with its 600-bed capacity is the largest Hilton Garden Inn hotel in Turkey and Eastern Europe.

Defence Turkey: Considering your important position and technological experience in the market for data centers what is your current position in the defence sector? What are the projects and activities in this area?

Can GÜR: Canovate has built the data centers of the Presidency of Defence Industries and UAV systems as the subcontractor of STM. In addition, as a result of our R&D work, carried out for 2 years, within the scope of the Internet of Things (IoT) product for the defence industry and general industrial applications, we have developed the IP-PDU (smart plugs, Wi-Fi enabled plugs) product family. We also developed IP based environment monitoring systems, IP based modular automatic fire extinguishers used in IT server rooms and micro data-center cabins, IP based access control units and data center infrastructure management (DCIM) software.

Defence Turkey: Canovate High Technology is involved in the "Urban Safety Management System" project, which is implemented in all towns and cities in Turkey. As the project partner of Aselsan and Havelsan, can you inform us about the process, technology, capabilities, and the current situation on this topic?

Can GÜR: We are involved in



KGYS Box

the "Urban Safety Management System" project as the project partner of Aselsan and Havelsan. As is known, the "Urban Safety Management System" is a highly sophisticated project with a number of approximately seventy thousand cameras nationwide. Camera systems are highly effective applications concerning both traffic regulations and public security. As well as its deterrence, it contributes significantly to our security forces and judicial processes in clarifying the events. The system is designed to operate constantly on a 24-7-365 service basis. As Canovate, we produced the systems called "KGYS Box" or "Field Cabinet on which the cameras are mounted. This is not just a cabinet. The system consists of a power box section considering the power outages, as well as switches, voltage regulators, and active cooling units for uninterrupted and rapid transmission of the acquired images. It was designed and produced to work even in the hottest-arid and coldest-rainy climate conditions of our country. More than 17 thousand of these systems were produced and delivered. Another part of the project is field installation. In 23 provinces, Canovate completed the field installations of these systems to a

large extent. Some of them became operational, while some of them are still undergoing acceptance tests. As Canovate, we take the necessary measures to ensure the uninterrupted operation of the system in the future. This project is the largest and biggest MOBESE (Mobile Electronic System Integration) application in the world with an overall project value about US\$600 Million. With the experience and references we have acquired here, we won the tender for the Northern Iraq KGYS system including all the equipment and devices. Also, we compete in tenders in Saudi Arabia and some countries in Latin America, and Africa.

Defence Turkey: In today's geography the concept of border security has become more important. What are the other products and capabilities of Canovate Group in this area? Can you share information about the programs on thermal radar and electronic warfare?

Can GÜR: We developed the PanTher Radar, the first electro-optical radar of Turkey. The "PanTher Radar", which provides 360-degree panoramic observation capability in all weather conditions, started to be used in different fields such as airports, border security, pipelines, coastal security, and wildfire prevention. The first electro-optical radar of our country was developed by Turkish engineers within the Canovate Group as a result of approximately 3 years of R&D. With all these features, the system can be used in military bases, airports, areas with special security requirements, borderline, ports, etc. and it is an alternative to the high-cost radio frequency-based active radars used today. The "PanTher Radar" can be adapted to anywhere with a need



IT Server Room

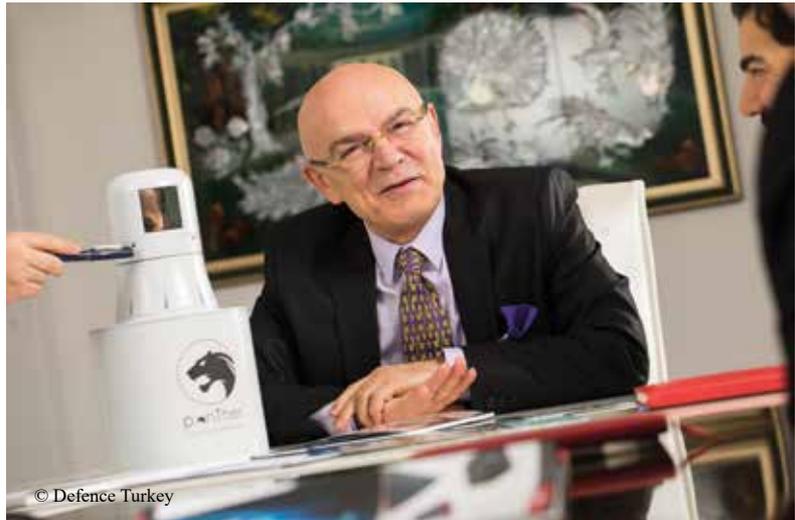
for security and surveillance. The system can be easily used instead of long/short range radars and CCTV systems. Currently, there are ongoing security and surveillance systems installations at the airports and borderlines of our country. The Canovate PanTher Radar system we offer provides a cost-effective and high-performance solution that can be used for all these systems instead of imported products. At present, high cost long/medium/short range RF radars, PTZ-IP CCTV systems and PTZ-IP thermal systems are used in security and surveillance systems. The PanTher Radar can perform all the tasks of these systems by itself. In short, the Canovate PanTher Thermal Radar system scans a 360-degree view on the site, provides a 25-35-degree



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PanTher Thermal Radar

field of view depending on the camera angle, and sounds an alarm when it detects thermal traces or motion in the area it scans. The system also features magnification capability and if required it can zoom in on the desired region. The PanTher Thermal Radar, unlike its counterparts, can be provided with an IR laser illuminator & rangefinder and high-resolution daylight camera with zoom. Furthermore, we are working on algorithms such as smoke detection, particularly to be used in wildfire prevention. In addition, to provide a solution for these requirements we equip the Thermal radar with sensors that measure humidity, temperature, wind, and air pressure values. Thanks to our mini data center that we produce as Canovate, it is also possible to centrally monitor various thermal radar units in a specific region. Currently, we are conducting an R&D project on this matter. With our aforementioned domestic and



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national product families, the SSB invited Canovate to the tender for the "360-degree situational awareness system" to be fitted on the armored vehicles in Turkey.

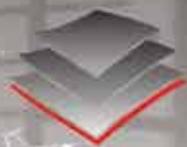
Defence Turkey: In recent years, Canovate bought a company, which was established in the UK with the partnership of British Aerospace, with 40 years of bulletproof vests and ballistics manufacturing experience and certifications, and then moved to it Turkey. Has this new facility started production yet? Which products will the factory mainly produce? Do you have "niche" product capabilities that will make a difference for ballistics in the competitive global markets?

Can GÜR: Armourshield in Manchester, UK, was a factory that provided bulletproof vests to the American and British army (such as the troops in Afghanistan) for 42 years. At Canovate, we bought the Armourshield factory in Manchester, UK, with its know-how and equipment. We moved the production line at the Armourshield factory to our factory in Çekmeköy. In addition to the overseas certificates, we have also obtained the required certificates from within the country. Our investments in ballistic systems are still ongoing. At the end of this month, we will install a new autoclave in our facilities and initiate the production process. At the first stage, we manufacture products known as Bulletproof Vests. We are producing different combinations of flexible fabrics -Aramid and UHMWPE (Ultra-High-Molecular-Weight Polyethylene)- known as

Soft Ballistics. In this manner, our R&D studies continue to increase energy absorption values and reduce costs by 50%. One of the most vital crucial features of the soft ballistic equipment is the Backface Deformation. Our Trauma Plate option, which significantly reduces this value, is also available to our customers. Furthermore, we also manufacture Hard Ballistic protective plates produced by using Aluminum Oxide, Silicon Carbide, and Boron Carbide. In this context, we continue our R&D studies to decrease weight, reduce costs and increase the rate of localization. Vests with "Quick Release" mechanism to quickly remove the vest and "Floating Vests" designed specifically for maritime operations are among our niche products. Regarding the ballistics, we also produce the armored versions of our container data centers if requested. In addition, we also consider vehicle armoring and



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ADVANCED COMPOSITE PRODUCTS

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PERSONAL PROTECTION

HELMET



The new PPH lightweight helmet portfolio provides the optimum blend of high level ballistic protection and comfort.

VEST



PPV Ballistic Vest portfolio meets various needs of the operational units and complies with the international ballistic standards.

INSERT



Optimized hybrid structure to ensure the lightest weight possible whilst providing the lowest blunt trauma.

SHIELD



Modular and customizable design allows various configurations to ensure appropriate protection for law enforcement and private security personnel.

VEHICLE PROTECTION

LAND



Combat proven add-on and spall liner products add minimum weight to the vehicles without compromising on maneuverability and range.

NAVAL



Environmental conditions such as high corrosion, vibration and effects of saltwater are taken into consideration in the design of the panels and mounting systems.

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CES Advanced Armour is an AS9100 certified and approved supplier for modular ballistic floor panels and armoured wing panels.

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armored cabinet production as a potential business opportunity for us.

Defence Turkey: Can you tell us about your studies on UAV and Drone systems?

Can GÜR: Today, the use of Unmanned Aerial Vehicles has increased in various fields. Our company CanAero has been established to operate in this field. Currently, we are assembling a military drone for our Armed Forces. In this respect, we are working on drones with extended range, altitude and increased endurance that do not exceed 5-6 kg. We are planning to use our "Spider" and "Octopus" drones, which are currently under development, in military and industrial fields. For example, we are working on extremely light systems, which can leave its payload to the desired location, return autonomously and perform interim maneuvers by detecting the obstacles ahead. These systems will be used in forest fires, first aid, border surveillance, perimeter security, and in agricultural applications such as agricultural pesticides and aerial seeding. They are also used in military applications such as image acquisition, first aid & equipment transfer, CBRN disinfectant spray and drop & delivery to the target. Of course, equipping these applications with the necessary sensors and locally producing the software and the necessary algorithms are crucial elements in terms of safety & security.

Defence Turkey: The importance you give to R&D as Canovate and Can GÜR seems to be obvious considering your achievements and the work you have carried out so far. In this context, what is your new vision and R&D goals in the field of defence? What is your plan for the development of critical technologies need by the sector, with local resources? In which areas are you conducting your studies?

Can GÜR: In parallel with our knowledge and experience including the Internet of Things (IoT), Industry 4.0, ballistic vests, Drones, electro-optical radars, terahertz scanners, Urban Safety Management System, and E-Agriculture applications, we will further contribute to the



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critical technologies required by our defence industry with local capabilities.

Defence Turkey: As a company that exports to 72 countries and dominates some of the markets in a leading position, what are your efforts and goals for the export of your defence industry products and capabilities? Are there any projects carried out on this matter?

Can GÜR: Canovate Group companies develop and manufacture all of their products not only for the domestic market but also for export to global markets. In this context, Canovate Electronics exports 70% of its production capacity to 72 countries in 4 continents. Likewise, we aim to export our products such as PanTher Radar developed as Turkey's first electro-optical radar, Terahertz scanners produced in

cooperation with TÜBİTAK, CBRN disinfectants and drones, bulletproof vests, and the Internet of Things (IoT) product family mainly to abroad. We will participate and exhibit our products at the IDEF 14th International Defence Industry Fair between April 30 - May 3, 2019.

Defence Turkey: Finally, is there a message you want to send to our readers?

Can GÜR: What we should do next in the defence industry, as Turkey, is to develop our own satellites, UAVs and swarm drones, fixed-wing aircraft, unmanned autonomous armored vehicles, loitering munitions, spy VTOLs and micro-drones, and medium & long-range missiles in aviation and space industry. As Canovate Group, we will continue to transfer our knowledge and experience which spans many years in data centers and fiber optic products to our defence industry ■



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Can GÜR met up with Ayşe EVERS - Editor in Chief of Defence Turkey Magazine in Cannovate corporate office, Istanbul



RETINAR

Perimeter Surveillance Radars

*Perimeter surveillance, camp protection
and border security*

Detection and tracking of moving objects

*Classification of threats as human, animal, and vehicle with
spectrogram analysis*

Small size and light weight

Innovative and user friendly interface

Detection of all moving targets up to 10 km

*Slew-to-cue functionality for any type of pan-tilt
camera and weapon system*

360° continuous or sector scanning

Low Probability of Intercept (LPI)



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Aselsan Indigenization Alliance Summit

Aselsan gathered with subindustry and manufacturer companies that it collaborates with in design and manufacturing activities at the recent Alliance Summit held at Congressium Ankara

Subindustry and manufacturer companies that Aselsan collaborates with in design and production activities gathered at the Alliance Summit held at Congressium Ankara. Minister of National Defense Hulusi AKAR, President of Defense Industries Prof. İsmail DEMİR, Deputy Minister of National Defense Muhsin DERE, Deputy Minister of Industry and Technology Hasan BÜYÜKDEDE, Vice Presidents of Defense Industries Celal TÜFEKÇİ and Mustafa ŞEKER and many representatives of public and private industry attended the summit.

Delivering a speech at the summit, Minister AKAR congratulated Aselsan for deciding upon the theme of the summit to be "indigenization". AKAR qualified the indigenization of the defense industry as an obligation, stipulation and a requirement rather than a preference for increasing the efficiency of the armed forces, increasing its deterrence and prestige, providing peace and safety to the country and for future generations, escalating the Turkish economy and defense industry to higher ranks in the international arena.

Minister AKAR stated that the security of the country would never be fully maintained without a military power that is not fully supported by the facilities and sources of the country. AKAR added, "We encountered difficulties, restrictions, implicit or explicit embargoes stemming from even friendly and allied countries in the procurement of modern weapons and munitions, although we had prepaid, and unfortunately we were faced with challenges" and gave examples from the past, underlining that the incidents throughout the Cyprus Peace Operation compelled the government to generate independent policies regarding the defense field.

Minister of National Defense Hulusi AKAR: "The Indigenous Rate has Reached 70%"

Stating that the steps taken towards manufacturing battle



weapons and vehicles with high technology in the country have started to bear fruit, AKAR continued: "At the point that we've arrived to today, Aselsan and four of our companies active in defense industry have started to compete with global giants. These defense industry companies that are now amongst the world's top 100 companies have been the source of our pride and they continue to be". Addressing Aselsan employees by underlining that the aforesaid achievements were not sufficient alone, Minister AKAR said, "With this determination and hard-work you already have shown the potential to reach even greater achievements."

Emphasizing that a great leap has been made in the defense industry with the successful domestic and indigenous approach, Minister AKAR said, "As a result of such actions, the indigenous ratio has reached 68-70 percent from 20 percent. Our efforts will continue with determination in order to increase this rate. In this geography full of risks and threats, we must be strong and successful for the peace and security of both our nation



Hulusi AKAR - Minister of National Defence

and for the individuals who tied their hopes to Turkey and for other friendly and allied nations. In order to become a powerful and successful country, we need to pursue our activities with an effective, indigenous and innovative defense industry approach that advances our national values and interests."

AKAR: "Defense and aerospace turnover reached US\$ 7 billion and Exports reached nearly US\$ 2.5 billion in 2018"

With conviction Minister AKAR stated that the strategic cooperation agreements signed last week between the Military Factories General Directorate and Shipyards General Directorate and the subcontractors were steps taken towards becoming powerful and successful, and he added, "In these times where the actors, roles and targets have changed their places, the Turkish defense industry has been renewing itself, developing constantly and gradually reaching a stronger position. Currently, we reached a point where we are signing export contracts with Pakistan on MILGEM, Qatar on FIRTINA Howitzers and with Ukraine on UAV. Our T129 ATAK helicopters are drawing attention worldwide. The HÜRKUŞ elementary and basic training jet is a candidate for being the apple of the eye of our Armed Forces. We are protecting our borders with domestic and indigenous combat vehicles and equipment and with anti

-drone systems. Having conducted its maiden flight, the GÖKBAY light class utility helicopter's mass production process will be launched soon. In addition to all these developments, the increase in the number of Turkish companies entering the list of top 100 global companies and the increase in the defense industry's turnover each year are clear indicators of our progress towards our targets for the year 2023. In 2018, the turnover of our defense industry and aerospace industry reached US\$ 7 billion, and our exports exceeded US\$ 2 billion mark for the first time and is approaching US\$ 2.5 billion. Additionally, I am pleased to express that our defense industry exports displayed an increase by 17 percent compared with the year 2017. However, I would like to underline that we have a long distance to cover despite all of these achievements."

Minister AKAR informed the audience about the latest practices of the ministry and expressed that the Procurement Directorate General accomplished the Certified Supplier Implementation. Minister AKAR said, "We continue our progress with the system of the 'Pool of Certified Suppliers' in order to benefit from domestic and indigenous products in our factories and to procure from domestic manufacturers" and added that with this system and by selecting the most appropriate supplier they aimed to achieve long running and productive cooperation, and achieve flexible and reliable supplies with low logistical costs. Noting that within the scope of the system, fulfilling the requirements of military factories ranging from software to design, from the medical industry to R&D, from domestic companies that fulfil technical specifications as well as quality and performance criteria, Minister AKAR concluded, "Hereby, I invite all our companies to apply to participate in our Ministry of National Defense's Pool of Certified Suppliers."

President of Defense Industries Prof. İsmail DEMİR:
"We have to continue by increasing our targets"

President of Defense Industries Prof. İsmail DEMİR stated that the defense industry is one of the sine qua non factors regarding the survival of a country. Mentioning that the activities in this field continued across the country in a way that makes



Prof. İsmail DEMİR - President of Defense Industries

the nation proud, while increasing confidence, Prof. DEMİR continued: "There is a distance we need to cover, and we have to continue our progress by constantly increasing our targets. If we are able to be active in the work that we accomplish, in the decisions we make in operations and in the field, with our self-confidence, to the same extent that our security forces struggle for the survival and security of our country we can say that Turkey and Turkish industry should be regarded as a whole. We are capable of performing activities in the field with domestic and indigenous systems and this is the path that we confidently and proudly proceed upon."

Prof. DEMİR pointed to the existence of certain main contractors who are assuming the role of pioneers in the industry and added, "These companies play a critical role. Although they are sycamore trees, instead of being trees that do not allow any other plants to grow around them, they have to be structures that bring up many saplings and turn this sector into a forest."

President and CEO of Aselsan Haluk GÖRGÜN mentioned that their company is proof of an alliance focused on sacrifice and the feeling of joint achievements will contribute to long term targets rather than individual sacrifices or achievements. Also touching upon the main targets of the company GÖRGÜN said, "Our main target is not only growth, but growing together and growing it together. Presently, the most critical subject for a powerful Turkey is the necessity of the joint action of all shareholders strengthening our national defense industry that aims to offer innovative and reliable solutions that decrease the foreign dependency in terms of technology".

Regarding the "Aselsan Social Innovation Leaders - ASIL" Project which they will be launching in Turkey for the first time, GÖRGÜN shared

the following information: "The ASIL Project will reflect our leading role in the defense industry to social projects as well and will serve as a model to Turkey for the development of projects towards fulfilling the requirements of our country, our society and their improvement. Under the roof of this Project, we are building an informational and developmental platform for university students, professionals, suppliers and entrepreneurs. With this platform, we will be providing services focused on awareness, human resources, training, know-how and development for all of our suppliers".

Following the protocol remarks, the session on "Alliance towards Indigenization" started. This session was moderated by Deputy President of Defense Industries Celal Sami TÜFEKÇİ and Deputy Minister of National Defense Muhsin DERE, Deputy President of Defense Industries Mustafa Murat ŞEKER and Deputy Minister of Industry and Technology Hasan BÜYÜKDEDE attended the session as panelists.

The panel on "Sharing Aselsan's Vision" was held in the afternoon session. The panel was moderated by Aselsan Institutional Management Deputy Director General Assoc. Prof. Hakan KARATAŞ and HBT Sector Head Yavuz BAYIZ, MGEO Sector Head Prof. Sezai ELAĞÖZ, REHIS Sector Head Oğuz ŞENER, SST Sector Head Mustafa KAVAL, UGES Sector Head İbrahim BEKAR attended as panelists.

A panel on "Indigenization" was held again with the participation of officials from Aselsan's industry directorate. The panel was moderated by Prof. Mehmet ÇELİK. The Alliance Summit ended with a presentation on Aselsan's industrialization and procurement activities, the presentation of plaques to strategic partners and a Gala Dinner ■



Prof. Haluk GÖRGÜN - President & Chairman of Aselsan



Altay Software “Customer Specific” Military and Civil Information Technologies

An interview with Altay Software CEO – Baki ŞENSOY discusses the company’s balance between defence and civilian projects and Altay’s dedication to customer satisfaction and delivery-oriented work by expanding their range products and solutions. With more than 100 R&D employees specializing in the most advanced technologies, Altay looks forward to 2019 as the year when results of critical projects will be seen in the field

Defence Turkey: Mr. Baki Sensoy, first of all, thank you for taking the time for our interview. Altay Group has operated in an institutional capacity with activities serving the Turkish Defence Industry spanning over 60 years. Can you inform us about the transition from the early days of establishment to the technological transformation process that started with Altay Software?

Baki ŞENSOY: Our company was established in 1957. Looking back over the years that have passed we have had many experiences. We've learned to face challenges with confidence, diligence and fervency. With every opportunity we created solutions which served our customers by improving their capacity to be successful. 62 years, that's easier said than done. We have gone through some difficult times. As Altay, we performed our duties properly during the crisis in Cyprus caused by the escalating problems in 1974. Here, I would like to emphasize that we are proud of both witnessing and taking on responsibility for the positive development of our Defence Industry. Built on a strong foundation, the institutional structure of Altay traces back to the days of its establishment. The "Continuous Improvement Guidelines" of that time, became the Facility Security, MSB Production, CMMI, DO-178 or ISO certificates of today.

Defence Turkey: Altay software is regarded as one of the leading companies in Turkey with its domain expertise. In this context, can you inform us about your fields of activity, your organizational structure, your engineering and-administrative structure and your R&D center?

Baki ŞENSOY: Altay has approximately 62 years of accumulated expertise in different sectors and fields. In addition, we started our Defence Software journey in 1998. Our R&D center was granted approval by the Ministry of Industry and Technology. Today, we have more than 100 R&D employees specialized in the most advanced technologies. Recently, we renewed our organizational structure to meet the necessities that arose as result of our growth. With our new structure, we aim to provide quicker and more effective solutions for our customers. At the same time, we want to increase

the efficiency of our small number of administrative staffs. In this new structure there is more emphasis on technology management, and we highlight the concepts of "HR and Innovation".

Defence Turkey: How did you conclude 2018 considering the programs you completed for the military and civilian sector in domestic and foreign markets?

Baki ŞENSOY: Once again, our activities in the defence industry took first place. Additionally, in 2018, we made significant progress in the field that we call Corporate Solutions. Using our knowledge of defence technologies, we increased the number of products that we are developing for the civilian sector. In this regard, we managed to close the year by establishing a balance between defence and civilian existing commitments.

Defence Turkey: In 2003, Altay Software realized Turkey's first software export as a subcontractor to the Norwegian company Kongsberg with this assumed crucial responsibilities in classified military projects. Altay broke Turkey's perception of "western countries do not buy products and platforms from us" in 2003 and perhaps opened a door for numerous companies. What would you like to say about this important export success and other export achievements? Could you briefly inform us about your export performance since 2004 and the products that you have exported?

Baki ŞENSOY: The design and testing of software requested from us with a purchase order in 2003 for an air defence system (Hawk XXI) were completed in 2004. This product was registered as the first defence software export that required an MSB export permit. As you have mentioned, this was a turning point in breaking this perception and encouraging us to export new products in the future.

In the last period, Altay showed significant export performance. Referencing this success in figures; within 15 years, we exported products that are safely used by the armed forces of 16 countries. Having the support of our related institutions, we work with perseverance to reiterate this performance we achieved in the defence sector, once again in the civilian sector at an international level.

Defence Turkey: Altay software

accomplished various projects in Turkey. Since 2009, Altay software assumed a critical role in web-based software used by the Ministry of National Defence Information System regarding Recruitment, Mobilization, Human Resources, Document Management Roll Call and Incident Report Center and received an important award in 2016 with this particular e-government software. Between 2009 and 2014, an essential role was also assumed in critical projects such as NATO Collaborative Electronic Support Measures Operations (CESMO), Hand-Held Computer Hand Firing Based Calculation Software (ELA) with Roketsan, and with Anti-Submarine Warfare DSH-RAS Rocket Launching System Weapon Control Interface with Roketsan and Aselsan. These foreign programs reflected international success and created added value. Can you please share some thoughts on this as well as the national capabilities that were gained as a result?

Baki ŞENSOY: Although they may appear as different topics, what lies at the heart of our work is mastering technology and putting oneself in the place of the user authority. As you mentioned, we continue to carry out our responsibilities with great care in the Ministry of National Defence Information System (MBS) project. I would like to expand on this statement; we won the first tender of the Ministry of National Defence and delivered the MBS faultlessly within the projected calendar. We assumed this product's maintenance and compatibility amidst the changing conditions, acting as the party with the most reasonable approach in open tenders. As a recent example, in 2018, after the decision was made to provide paid military service, we ensured that the application can run without interruption during the Eid al-Adha. Receiving the appreciation of our Ministry of National Defence on this occasion, once again showed us that winning the most commonly used e-government application award in 2016 was not a coincidence.

In addition to the Aselsan and Roketsan projects that you have mentioned, we used our experience acquired from providing solutions for Havelsan and Turkish Aerospace to the maximum extent in the international arena. Our performance should be presented

clearly and thoroughly in foreign countries. I would like to emphasize the importance of the support provided to SME scale companies, which includes our company Altay, regarding participation in international events.

Defence Turkey: Altay Software assumed a critical role in projects such as “Land Forces Information Exchange Model” for the Turkish Armed Forces, “Command Communication Computer Software”, “Tactical Data Link Center”, and “Launcher Management Computer Simulator” for launcher systems as well as the YUNUS project and the “Virtual Maintenance and Operator Training Assistant” system. Can you inform us about your responsibilities in these projects?

Baki ŞENSOY: All the projects you have mentioned have common characteristics. When the general requirements are defined in these projects, the responsibility of our R&D teams starts. In these projects, you need to have a certain level of field expertise to create detailed requirements about the software. Our seasoned specialists with experience in similar fields undertake this task. Following this stage, we establish the appropriate team and design the required products within the scope of the project requirements.

We verify our products through our independent testing teams. The records of all of our work and related documents are archived. As a result, we can retrieve information whenever needed and fulfill new requests as needed.

Our main objective within the scope of the opportunities provided to us in these projects is to provide maximum benefit by integrating our software to add value to all related vehicles and systems used by the Turkish Armed Forces in the field at an operational and strategic level.

Defence Turkey: What kind of solution will you present in the “Electronic Warfare Operator Training Simulator” project which will simulate all electronic warfare devices? Can you share the current status and delivery processes of the project with us?

Baki ŞENSOY: We assumed a highly critical responsibility in the Electronic Warfare Operator Training Simulator project, which aims to provide an advanced training



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environment, as a result of the tender opened by MSB. The Analysis and design studies that started in the middle of last year accelerated toward the end of 2018. The Turkish Naval Forces Command made a significant contribution within the scope of this project, which we aim to complete in 2019. A simulator of each of the Electronic Warfare and Support devices in the inventory will be built. In addition, all the necessary software and hardware to create a training environment will be prepared within the scope of the project. If needed, simulations of future products can be easily added to the system thanks to its flexible infrastructure.

Defence Turkey: Apart from the defence industry, having a presence in the civilian sector is vital for a company regarding sustainability. In this context, can you inform us about Altay Software’s activities that are geared toward the civil sector?

Baki ŞENSOY: In terms of technology, military and commercial software have similar characteristics. We attach importance to transforming this technological expertise into different values for sustainability. Particularly, when examined at our

responsibilities that we assumed in 2018, it is seen that we began to provide valuable services to the civilian sector. We aim to reach a balance in the distribution of our defence and civilian-related work. One of the most major projects that will serve the civilian sector is the Retail Information System - PERBİS - which is supported by the Ministry of Trade and is aimed to be implemented this year. The Commodity Exchanges and Industrial Information Systems of a similar nature are also other examples of our work in the civilian sector.

Defence Turkey: One of the areas that Altay software attaches importance to is Industry 4.0 digital transformation. What are the R&D studies and investments in this context and how ready is the Defence Industry and Turkey overall, for the Industry 4.0 digital transformation? Can you share some information with us about the projects you have carried out and the necessary steps that need to be taken on this issue?

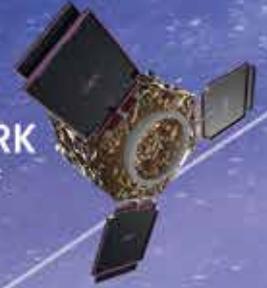
Baki ŞENSOY: Living in an environment with rapidly transforming technology, as Altay, we put a great emphasis on Industry 4.0. Therefore,



Electronic Warfare Operator Training Simulator



MMU
TURKISH FIGHTER



GÖKTÜRK
EO SATELLITE

**TURKISH
AEROSPACE**



ANKA
MULTIROLE UAV SYSTEM



HÜRJET
ADVANCED JET TRAINER AND
LIGHT ATTACK AIRCRAFT



HÜRKUŞ
ADVANCED TRAINER AIRCRAFT



GÖKBEY
MULTIROLE HELICOPTER



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THE SKIES AND BEYOND

due to the fact that we operate in the field of informatics, we work with enthusiasm to do even better. In 2018, we launched and implemented the first version of our Intelligent Production Management Software.

Our solution includes expert teams. This cost-effective system, by minimizing the technical operating load, will help SMEs in particular. The principal purpose of this product, which can be managed and controlled with their existing staff, is to increase productivity. In doing so, I must mention how much real-time production monitoring will contribute to the managers. These software design criteria include; effective production planning, real-time production monitoring, improving processes and reducing error rates. In 2019, we will focus on the necessary marketing and promotional activities for the expansion of our product while trying to add new capabilities to our product.

Defence Turkey: The Presidency of Defence Industries announced the R&D wide area call for the development of Artificial Intelligence technologies in the past period. We know that you have made substantial investments in this subject. What would you like to say about your work in this context?

Baki ŞENSOY: We responded the related call with two subjects we had previously worked on. The first of these aims to increase situational awareness and collect open source information in particular. The warnings of artificial intelligence algorithms to be commissioned here will be programmed to detect unexpected information flows. The second subject is the algorithms that learn to design effective and high-quality tactical networks. The network design through which the armed forces share tactical data is highly critical. We have presented a study to the SSB with the aim of increasing efficiency in the field and creating the best network topology. We believe that both studies will be considered and supported.

Defence Turkey: Mr. ŞENSOY, can you please touch on the company's goals for 2019?

Baki ŞENSOY: Like all actors in the industry, 2019 will be an important year for us. We will have the opportunity to exhibit and evaluate all the products and solutions manufactured by our engineers at the



upcoming IDEF event. We are making exceptional efforts to ensure that, following 2018 in which we believe we took all the right steps, that 2019 is also productive. Our new products will be in the field. It will be the year when we see the results of projects that we consider critical.

Moreover, it is important to be financially efficient while conducting our works as an SME company. The effect of economic fluctuation in 2018 is still noticeable. On the other hand, the number of pending orders became clear. Considering the current situation, although we need to increase our number of personnel, we should be careful when doing so. In line with the business objectives that we have set for ourselves in 2019, we have a growth expectation of 10 to 20% in terms of employees. In summary, by taking the right steps in 2019, we will focus on customer satisfaction and delivery-oriented work by expanding the range of our products and solutions.

Defence Turkey: Where do you see Altay software in the next decade?

Baki ŞENSOY: Established on a strong foundation with 62 years of

great dedication, we want to keep Altay's momentum moving forward for another 60 years. Considering the next 10-year period; we want to continue taking solid steps based on knowledge, just as we have thus far. Naturally, this process will bring forth growth and a variety of capabilities along with it. Our main goal here is to support the localization of our defence industry and to provide contributions to export targets with our products and solutions.

Defence Turkey: Mr. ŞENSOY, is there a message that you would like to convey to the readers of Defence Turkey?

Baki ŞENSOY: Beginning in 1957, throughout the story of the Altay family, we achieved steady performance increases and have made significant progress over the years. Thanks to the trust we have been endowed with, we continue our participation in military and civilian projects. Being involved in projects of such magnitude at different scales and the level of importance that it conveys over the years is a source of pride for us. I would like to express our deepest regards to all readers of Defence Turkey magazine ■



Baki ŞENSOY and Ayşe EVERS

EMPOWERED BY KNOWLEDGE

16 EXPORT
COUNTRIES



COMMAND CONTROL SOLUTIONS
TACTICAL SYSTEMS

SIMULATION, TRAINING AND
TEST SYSTEMS

ENTERPRISE INFORMATION
SOLUTIONS

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Total Volume of Projects Carried Out by MilSOFT Reaches US\$ 123 Million

With a fruitful twenty-year history, one of Turkey's greatest software companies, MilSOFT hosted press members of the defence industry at its headquarters at ODTÜ Teknokent on 9 January 2019. We had the opportunity to gather information on the current status of the company as well as its projections with a vision aiming toward international competition. The press meeting hosted by the Co-Founder and CEO of MilSOFT İsmail BAŞYİĞİT

MilSOFT CEO İsmail BAŞYİĞİT, Deputy General Manager in Charge of Production and Programs Hakan ZEREN, Director of the Programs Mehmet DEĞİRMENCİOĞLU, Director of Development and Marketing İbrahim AKSU, Product Manager Ekrem SERİN, Quality Manager Burak BAYSAK, Contracts Manager Deniz KÜZECİ, Business Development Manager Sinan TOPUZ and Consultant to the CEO (Ret.) Air Com. Pil. Sargun GÖKTUN attended the meeting and the opening remarks were delivered by MilSOFT CEO İsmail BAŞYİĞİT.

Noting that MilSOFT was established in 1998 in order to become a system integration and software technologies company capable of competing in the international arena and that the company went through structuring to this end, BAŞYİĞİT began with the following: "From the outset of our founding, we aimed to build a system integration and software technologies company capable of competing in the international arena. In order to achieve international competition, we adopted the supporting principles of conducting business in line with international standards and conducting production compatible with the international quality standards. Moreover, we started this journey with the aim of building a company capable of revealing the latest technologies before our rivals in the international area, a company that is able to develop its own technologies. We prepared documents containing answers to the question of how to design projects in accordance with international standards in the company in advance of employing Software and Electronics engineers,

then we identified specific R&D projects and made an application to TÜBİTAK. Up to date, none of our project applications to TÜBİTAK were rejected. We projected several R&D projects in our fields of business. While carried out these projects, we gained the experience of implementing international standards in these projects. We assumed our first international project from the Sikorsky Company. SeaHawk Helicopters were retrofitted from classic cockpit to the glass cockpit by Sikorsky and one of our teams collaborated with them in the US during that period. With the help of our know-how fully compliant with international standards, our culture of interoperability and the competence of our engineers, they were called to the tender. We were assigned a project at an amount of US\$ 5 million regarding a system for collecting the data from all systems of S92 helicopters, reporting the breakdowns to a pilot, recording these data and providing maintenance staff. We delivered the software by receiving the first FAA certificate, in 2004 and 2005."

Assuming the critical task software for the S-92 in international arena - the Data Computer Software Maintenance Project in 2002, MilSOFT had the Maintenance Data Computer (MCD) software certified for this project with the RTCA/DO-178B Standard Level C certificate, and confirmed the compatibility of the software with the rules of the US FAA (Federal Aviation Administration) and as a continuation of this achievement, MilSOFT also successfully completed the Task Computer software of the SeaHawk helicopters and delivered it to the procurement authority.



İsmail BAŞYİĞİT - CEO of MilSOFT

BAŞYİĞİT: "We were the first company in Europe to Obtain the CMMI 5 Certificate in 2005"

Stating that they built a system by focusing on future technologies rather than the present circumstances, BAŞYİĞİT continued, "Within the scope of our founding purpose, when a request emerged, we aimed to be the best fit for it. Therefore, we are presently operating as a single source in a sense in many areas. We provided the command control software in Search and Rescue Ships, the Link-16 Command Control Systems in particular in Tactical Data Links, and we also delivered this capability to the G-Class frigate of our Naval Forces Command, then to the Landing Ship Tanks and to 3 ships as part of the MILGEM project. We continued to conduct business in foreign countries in the meantime. We are executing significant projects in Italy, Germany and Pakistan. We received the CMMI5 certificate in 2005 and we were the first company that had reached such a level in Europe."

Underlining that thinking towards the future is the essential part of MilSOFT's culture, BAŞYİĞİT said that they focus on ways of

transferring the know-how acquired in national and international projects and the technologies emerging for the future to the software systems of the Turkish defense industry, adding that their aim is to provide on-time delivery of the best qualified products to the Turkish defense industry.

Upon the question on whether they will be planning any joint ventures in the upcoming period, BAŞYİĞİT emphasized that companies developing their own unique technologies should remain national and he said that even though they do not think of transferring the core technologies abroad, they are ready to transfer the products and technologies which were developed and utilized by the customers upon the approval of the Ministry of National Defense.

Director of Business Development and Marketing
İbrahim AKSU: "Our Naval Information Exchange System - NIXS was launched for use for a customer abroad"

Following MilSOFT CEO İsmail BAŞYİĞİT's speech, Director of Business Development and Marketing İbrahim AKSU made a presentation on the projects conducted by the company within the country and abroad and its projections on the upcoming period.

Noting that MilSOFT was founded in 1998 as a 100% private Turkish company, today operates with nearly 200 staff at two different campuses at Istanbul Teknopark and ODTÜ Teknopark, AKSU continued: "Quality is at the top of our sine qua non values. One of the most crucial factors of our quality is holding a CMMI5 level certificate; we are the first company ever in Europe and Turkey that achieved this level.



İbrahim AKSU - MilSOFT Director of Business Development and Marketing



And in other areas, we obtained NATO's AKAP 2310 and AKAP 2110 and ISO quality certificates. Besides our national and NATO confidential certificates apply both for our facilities and our employers. Presently, at the CMMI5 level, among nearly 10 thousand CMMI followers, 27 organizations in Europe and 600 organizations across the world are at CMMI5 level. In 2005, MilSOFT became the first user in Turkey and in Europe. CMMI's advantage to the end user is the delivery guarantee in line with the budget and on the schedule in a way that meet all the specifications. All the work performed is being documented in terms of achieving permanency and this facilitates permanence and moving onto the next stage."

Explaining that they split their activity areas into 8 main groups, AKSU added, "Regarding the Command Control Area; we developed infrastructure software, C2 and C4I Systems Infrastructures, Combat Management System (Mil-CMS), Coordinated Naval Operations, Naval Information Exchange System and Strategic Level C4ISR Solutions. The systems we developed in Tactical Data Links and Messaging areas are being utilized in many platforms. We developed all the Tactical Data Links from Link-1 to Link-22. By benefiting from our experience in Tactical Data Links, we offered the indigenous tactical data links (Link-1, Link-11, Link-16, Link-22), JRE Processor unique Tactical Data Link/ Network Solutions (Mil-Link/ Link-M) to our customers. Considering Intelligence, Reconnaissance and Surveillance and Image Sensing Systems we have ISR systems, UAV specific ISR solutions and sensing solutions

specific to sensors."

Adding a few notes to the presentation at this point, MilSOFT CEO İsmail BAŞYİĞİT said, "The Link-1, Link-11, Link-16 and Link-22 Tactical Data Links are the systems still being utilized by the US and NATO. The utilization of these Tactical Data Links in the world depends on the permission of the US and NATO, it is not granted to every country or it is being provided over specific hardware. We launched R&D activities in 2001, the first project activities in 2006 and later in 2009 we initially developed the Link-16 and Link-11, and then the Link-22 Tactical Data Links for the submarines, for the Turkish Armed Forces. We developed Links operating with existing devices that are not subject to export licenses. My colleagues will be sharing the details with you in a little while."

Talking about the activities they conducted in Electronic Warfare Modelling and Simulation, Embedded Systems, Information Technologies and Cyber Security over the slide, AKSU noted that they are developing various software in Training and Simulation area and added: "We are developing simulation software of all types and we also provide solutions regarding electronic warfare, data link training and simulation. The feature we put to forefront in this area is the interoperability of the products in this platform as they already utilize the same infrastructure and technology. If we take a look at the Command Control combat computer technologies; we have command control and C4I system as well. Our Combat Management System is being utilized by Coast Guard Search and Rescue ships. We developed a system we refer to

as the Naval Information Exchange System - NIXS for the Naval Forces of one of our friendly nations. Moreover, we have strategic level C4I solutions as well.”

Naval Information Exchange System (NIXS)

Developed through national resources, the Naval Information Exchange System (NIXS) provides great situational awareness to end-users and it is currently utilized successfully by an undisclosed country's Naval Forces. MilSOFT has accomplished the development and delivery of the NIXS, in record time, such as 8.5 months after the effective date of the contract. MilSOFT is currently getting prepared for proposing the NIXS solution, which displayed great export success, to the Turkish Naval Forces and the Coast Guard Command at home as well. The NIXS System could be utilized through a laptop in surface platforms. Besides, when a big screen is requested, the image on the laptop could be reflected to the big display at the Combat Information Center (CIC). Two different images are generated on the vessel, and one of them is the tactical image prepared through the sensors while the other is the regional tactical picture sent from the Headquarters. The decision maker on the vessel is able to pick one of the two images and display it. The Headquarters which is a fusion center generates the regional tactical picture in light of the data transmitted through the platforms equipped with the NIXS and then it publishes/sends this image to the vessels within the IP based network, according to the 'Area of Interest'. As the Headquarters imprints the regional tactical picture to the vessel, it transmits the assignment order at the same time. All this communication could be conducted securely through encryption. Within this context, if the user to whom MilSOFT provides its own encrypted solution has its own indigenous encryption, then this encryption system could also be integrated with the NIXS as per the request.

Extending information on MilSOFT's references since its establishment AKSU said, "Taking a glance at our references; Modernization of GABYA class



Frigate Modernization (GENESIS) and MILGEM combat management system's middleware maintenance and development were accomplished under our responsibility. We developed the Link-16 command control solution and accomplished the integration to the Frigate and MILGEM ships. We delivered the Combat Management System to the Coast Guard Command and provided the Coast Surveillance Radar System with the same infrastructure. We accomplished the ESSM guided missile integration of our frigates with NAVSEA and Naval Forces Command Research Center Command. We have been providing our DDS product to our defense industry companies such as Aselsan, Havelsan and Roketsan. We have been delivering Tactical Data Links to GABYA Class Frigates since 2010. As MilSOFT we indigenously developed the Tactical Data Link solution. This solution was completely cleared from the restrictions of the NATO or the committee authorized to decide on any subject related with the links and was fully developed through national resources. We developed the software causing such restrictions such as Network control software, crypto software completely indigenously and tested them through national resources.”

Mil-Link Solution Integrating the Radios over the Ship on an IP Network with a Single Application

Mil-Link solution integrates the radios over the ship on an IP network through the help of a single application. Therefore, an IP Network could be derived via the radios over the ship. When a tactical data link processor and a network control are added over this

Naval Information Exchange System (NIXS) infrastructure, the Link-M emerges. While the network control software subject to Link-M license is being developed fully indigenously, it is capable of operating without any restrictions over the indigenous crypto or existing modems or the HF or UHF radios over the ship. Capable of operating with the indigenous radio, modem and crypto systems manufactured in Turkey, Link-M will enable the utilization of a network built between the military platforms with an indigenous link. The domestic and indigenous tactical data link's eliminating the obligation of utilizing the software/ hardware subject to the license at the NATO systems creates a critical potential in terms of exports as well. On account of this characteristic, Link-M could be exported to the friendly and allied countries without the license of the third countries. The Link-M system is being tested between naval platforms with the approval of the Naval Forces Command, and meanwhile nearly 3000 messaging were achieved over approximately 260 miles between Aksaz- Gölcük. The tests are still ongoing.

Expressing that in addition to the indigenous solutions, they were accomplishing critical deliveries to the Turkish Naval Forces regarding the Link-11, Link-16 and Link-22 solutions utilized across the world, AKSU added, "We provided the Link-11 simulator for the HELSiM - Helicopter simulation center, Link-11 processor to the Thales Aircraft for the MELTEM-II Maritime Patrol Aircraft utilized by our Naval Forces and the Link-16 processor to the Alenia MELTEM-III Maritime Patrol Aircraft utilized by our Naval Forces Command. Also, as the subcontractor of Havelsan, we delivered the Link-11

and Link-16 Tactical data processors to the LST ships.”

Link-16 Enables a Communication Range of 300nm within LoS

Link-16 is designed for the exchange of reconnaissance data, EW data, flight assignments, weapon allocations and control information. It enables a data communication resistant against jamming which integrates all command and control data and the target information between the aircraft and the Tactical Air Control Parties [TACP]. Link-16 is constantly and automatically updated.

Link-16 communication is limited with the Line of Sight (LoS) and the system operates at the UHF band. Still, the alternative systems are required since Link-16 is limited with the LoS and utilizes a different message format. Link-16's maximum communication range within LoS is 300nm (555km).

Link-16 uses data words of 70 bytes and conducts serial transmission. In each transmission time slice 3 or 12 data words could be transmitted. The number of the data words forming one Link-16 message varies, but under normal conditions it is one data word or two or three data words.

The ongoing projects of the company providing Tactical Data Link Systems to numerous platforms of the Turkish Armed Forces are composed of the following:

- › Link-11 and Link-16 Tactical Data Link Systems for 8 G-Class Frigates and 2 GKMs.
- › Link-11 and Link-22 TVLS for the 6 New Type Submarines as part of the New Type Submarine Project,
- › Link-11 and Link-16 TVLS for the 1st and 2nd ships of MiLGEM,
- › Link-11 and Link-16 TVLS for the 3rd ship of MiLGEM, (acceptance of the SAT tests completed as of 31 December 2018)
- › Link-11 and Link-16 Tactical Data Link Systems for 2 LSTs
- › Link-16 Tactical Data Link System for 6 ATR-72 Maritime Patrol Aircrafts,
- › Link-16 Tactical Data Link System for 19 C130 Platforms
- › Link-16 Software for the Integration of Medium Altitude Air Defense System (HISAR).



Unique Tactical Data Link (Link- M)

ATMACA Missile Could be Controlled via the SatCom

Moreover, MiISOFT developed the software enabling the missile control (missile, aircraft and vessel) via the SOM and ATMACA Missile's Link-16 Network, the activities were launched in 2014, through its own resources.

Under normal conditions, the communication range over the Link is maximum 300 miles depending on the correlation conditions of the HF system environment. For instance, the Tomahawk Cruise Missiles are capable of conducting their data link communication via SatCom. In this respect, there is a JLF standard set for SatCom satellite communications and MiISOFT owns a solution in this area. The link capability communicating via SatCom will be delivered to the procurement authorities under the projects, the contracts of which were recently signed with Aselsan. Within this scope, ATMACA missile could be controlled via the satellite. In the current situation, the communication of the platforms has to remain within the Link-16 LoS. The correspondence is presently being controlled over the HF/UHF communication.

R&D Projects on Block Chain Networks and Swarm Drone Concept

In his presentation, Business Development and Marketing Director AKSU also delivered information to the press members on MiISOFT's newly launched projects. The information on the presentation slides shared that the company has already launched the project on

the modernization of NEKSIM joint electronic warfare simulation system, the contract signed with Aselsan in November 2018 on the HERIKKS-6 tactical data link to be provided to air defense system and the project on the tactical data link capability to be provided to the HERIKKS system. In addition, MiISOFT has also been executing various R&D projects under its auspices. According to this, the company also has an R&D project that was launched in April 2018 for the acquisition and tracking of mobile targets under the coordination of the drones. The development of a swarm drone concept application is aimed in this project. In addition, MiISOFT launched a project on Block Chain networks in December 2018, supported by TEYDEP 1511 again. Following the development stage which is planned to last 24 months, the know-how acquired is aimed to be integrated to defense systems.

MiISOFT Gaining 60% of its Total Turnover from Exports

Having signed project contracts with the approximate size of US\$ 231 million since its establishment, the total volume of contracts presently being executed by MiISOFT is nearly US\$ 123 million and 31% of this amount is composed of foreign sales.

According to the data provided by the Turkish Exporters Assembly (TIM), MiISOFT placed 170th on the list of Turkey's top 500 greatest Exporter Companies and the company is 6th in the sector ranking. Obtaining 60.2% of the total turnover from exports, the Company's export revenues amounted to US\$ 8.8 million ■

National Collaboration for Turkish Fleet Replenishment Vessel

The combat system components of the Fleet Replenishment Vessel (DIMDEG) to be built within the scope of the contract signed by the Presidency of Defense Industries and Sefine Shipyard will be supplied by an Aselsan - Havelsan Business Partnership

A Fleet Replenishment Vessel (DIMDEG) will be constructed within the scope of the contract between the Presidency of Defense Industries and Sefine Shipyard and the combat system components of the vessel will be provided by an Aselsan - Havelsan Business Partnership.

During the ceremony held at Sefine Shipyard, signatures were provided by Aselsan President and CEO Prof. Haluk GÖRGÜN, Havelsan Vice President of the Board Mustafa ŞENOL and Board Member and General Director of the Sefine Shipyard Demir KOLOĞLU.

The Fleet Replenishment Vessel (DIMDEG) will be primarily performing its tasks in order to support the vessels/ task group components operating in the open sea.

DIMDEG to Support Battle Ships in the Open Sea

DIMDEG will be able to maintain the replenishment of a minimum of four vessels with maintenance supplies (food, water, medical equipment, fuel, ammunition, etc.) without the support of the coast, through the method of replenishment at sea. DIMDEG will also support the maintenance, repair & overhaul of vessels and manned and unmanned surface and underwater vessels, helicopters and unmanned air vehicles on the vessel's flight deck.

DIMDEG will have an overall length of 190 meters, height of 7.2 meters, displacement of 22,000 tons and a beam of 25 meters. It is to be powered by two gas turbines and two diesel engines and the DIMDEG Fleet Replenishment Ship will have a maximum speed of 24 knots.

DIMDEG will perform as a Command - Control Ship and within the scope of the non



- combatant operation it will support the activities as part of humanitarian aid, fight against piracy, natural disaster aid, search and rescue, and evacuation of non - combatants.

DIMDEG will be the second greatest ship of our Naval Forces following the LHD and will be built and delivered by Sefine Shipyard in line with the contract signed with the Presidency of Defense Industries. Within the scope of the Project, the following Combat System components will be provided by the Aselsan - Havelsan Business Partnership:

- › Combat System Integration – Aselsan-Havelsan Business Partnership
- › Navigational Aids – Aselsan
- › EMI/EMC Analysis and Test Studies – Aselsan

- › Integrated Communication System – Aselsan
- › Satellite Communication System – Aselsan
- › IFF System – Aselsan
- › Helicopter Control Radar – Aselsan
- › KIRLANGIC Night/ Day Camera System – Aselsan
- › Stabilized Artillery (STOP) System – Aselsan
- › Combat Management System (SYS) – Havelsan
- › Ship Data Distribution System (GVDS) – Havelsan
- › Ship Information System (GEBIS) – Havelsan
- › Message Operating System (MIS) – Havelsan

Under the program schedule, construction is expected to be launched in early 2019 and the ship will be delivered in late 2023.





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FEMSAN on Track to Become an Important 'Technology Producer'

In this exclusive Defence Turkey interview, FEMSAN General Manager - Melih Turan İPEKÇİ shares FEMSAN company insight and it's 30-year history manufacturing electric motor

DefenceTurkey: FEMSAN has been active in designing and producing electric motors for 30 years and has been manufacturing products for the defence industry for the last 15 years. Can we get information about FEMSAN's current organizational structure, personnel status, 2018 growth, and expectations for 2019?

Melih Turan İPEKÇİ: We have been serving in this sector since 1989. As the FEMSAN family, by means of gained achievements during this 30-years period, we have completed considerably critical tasks.

These days, we have two different production facilities which are subsequently for general industry and for the defence industry. Our number of total employees is now over 160, including our R&D company with its 20 personnel. Serious conversion and improvements have occurred in our national defence industry for the last 4 years. Undoubtedly, awareness and the positive atmosphere that exist in our defence industry brought forth benefits to FEMSAN while it was attempting to improve its activities in this field. We achieved considerable growth in 2018. Our expectations for 2019 are that we want to keep growing in a controlled manner at first and foremost. Our preliminary preparation has been completed for export activities in the defence industry. You have to take your steps carefully and steadily to create a sustainable business collaboration in the international area.

DefenceTurkey: Mainly operating in the fields of electrical, mechanical and electronic services, FEMSAN initially focused on Direct Current (DC) motors to meet the requirements of the period, however, in order to fulfill market demands over time, different types of motors such as Permanent Magnet/PM Motors, Servo Actuators and Aircraft Alternators are also included in the product range. What can you tell us about FEMSAN's current production infrastructure and main product range?

Melih Turan İPEKÇİ: We have quite a modern production facility equipped with high-level possibilities to serve the defence industry. Production processes

such as machining, laser beam welding, and painting are performed in this facility as well as assembling. In addition to this, by means of our capabilities to design and develop test platforms we are able to compensate our customer's test requirements.

Everything started by producing DC motors 30 years before. The world changes day by day and every period comes with new necessities. You have to give reasonable responses to the requirements of the present time that you live in. FEMSAN has done this magnificently and as a result has become the first servo motor manufacturer in Turkey. Today, we are the only component-based DC motor producer and have the capabilities to design and produce highly reliable electromechanical actuators, UAV alternators and some sub-systems such as wing assisted guidance kits for the defence industry.

DefenceTurkey: Can you inform our readers about FEMSAN's view of R&D, its R&D team, the share of R&D in turnover every year and the main R&D investments/activities?

Melih Turan İPEKÇİ: Innovation and R&D are the most important factors for companies to improve their businesses in Today's world. FEMSAN is moving forward step by step toward its future targets with this consciousness. We have an R&D company with 20 employees and around %10 of our turnover was allocated for R&D activities in 2018. FEMSAN has successfully completed three projects and on the other hand still, have six on-going projects for the defence industry.

DefenceTurkey: What can you share about FEMSAN's export activities and its position in the world? Are there any international events in which FEMSAN is currently interested? Can you inform us about your export targets?

Melih Turan İPEKÇİ: We already export motors produced for general industry. The direction of our Export activities are mostly Europe. We are going to start exportations for the defence industry in the near future and for this purpose, we have been actively participating in international defence and aerospace fair organizations. Our international marketing activities will be speeded

up in 2019, to build upon our proven national market success and carry it forward into the global market.

DefenceTurkey: Under the Presidency of Defence Industries R&D and Technology Roadmap, the Contract Signing Ceremony of Aircraft Materials and Control Actuator System Technologies Projects was held on February 20, 2014. At the ceremony, a contract for the Slotless BLDC Motor Development Project was signed between Turkish Aerospace (TUSAŞ) and FEMSAN Electric Motors Industry Partnership and the SSB. The aim of the project was to develop servo motors/actuators in accordance with DO-178 and DO-254 standards to be used in TUSAŞ product ANKA UAVs and other Strategic UAV platforms specified in the road map under a 36-month calendar with national resources. What can you tell us about the technical specifications of the ingeniously designed, produced and tested servo actuators and the current state of the project?

Melih Turan İPEKÇİ: The studies carried out within the context of this project, following the design actions in 2016, dynamic behavior development studies for ANKA's flight requirements were finalized in 2017 and the qualification process was started in 2018. The final stage of the project has begun, and its technical requirements had been determined by TUSAŞ considering of ANKA and future generation aerial vehicles. Servo actuators, certifiable in aviation and DO-254 compatible, will be taken part in our national defence industry after completing the qualification process. Thanks to FEMSAN's acquired technical capabilities these products may have been taken place for a lot of platforms. Several important technical features of servo actuators are listed as below;

- › Process: DO-254 DAL-B
- › Redundancy: Electronic Controller and Motor
- › Electricity Compliance: MIL-STD-704F
- › Environmental Conditions Compliance: MIL-STD-810
- › EMI/EMC Compliance: DO-160G
- › Reliability: MIL-HDBK-217F & NSWC-11
- › Altitude: 30,000 ft
- › Low Temperature: -55 °C

DefenceTurkey: As per the need for indigenous digital servo actuators for ANKA UAVs, you signed a contract with Turkish Aerospace on 31 December 2013 according to the SSB 2013 Annual Report. Can you tell us about the latest situation regarding the deliveries and the difference between the digital servo actuators that are delivered under the contract and the analog servo actuators that have been used before?

Melih Turan İPEKÇİ: The digital transformation of servo actuators in today's technology leads to many advantages. FPGA based control architecture has been installed on the control side and all current, speed and position controls, fail-safe controls, control of communication packages and



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Elevation Actuator for Machine Gun Platforms

monitoring of parameters have been implemented in the FPGA environment. Using the advantages of the FPGA control architecture, possible error conditions can be detected very quickly, and control cycles can be increased to very high speeds and creates an increase in the controllability and dynamic response capability of the system.

All the Required security functions on the servo actuator and aviation systems are entirely digitally implemented. The qualification process of the developed servo actuators was initiated in 2018 and the first deliveries are planned for 2019.

DefenceTurkey: Is it possible to use the indigenous UAV servo actuators developed under the project on other UAV platforms such as the BAYRAKTAR Tactical UAV and AKINCI Combat UAV?

Melih Turan İPEKÇİ: Within the scope of the project carried out under the roof of the SSB, during the qualification process of servo actuators, we have gained technological capabilities.



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Thanks to our capabilities, we are able to develop unique products for various platforms. Currently, linear actuators, that are being customized by similar technologies, can be used in many guided missile platforms. Studies for usage of similar systems such as the BAYRAKTAR/ AKINCI UAV and the Turkish Aerospace GÖKBAY Light Class Utility Helicopter, are being carried out in addition to guided missiles.

DefenceTurkey: FEMSAN also designs and manufactures the Fin Control Actuation Systems and Mechanical subsystems within the scope of the industrialization studies of Wing Assisted Guidance Kit (KGG) and Aselsan product STAMP RCWS. What can

could precisely move the weapon to the firing position. Besides, it is supposed that it maintains the required position for shock loads during burst firing, and of course, it is able to handle harsh environmental conditions. FEMSAN has been supplying customers reliable actuators to be carried out in any kind of mission for more than 15 years.

Fin control actuation systems (FCASs) are sophisticated sub-systems to control the position of the missile fins in response to steering commands from the flight computer. The typical FCASs consists of four actuators and associated control electronics all integrated into a ring that matches the outer mold line of the missile. FEMSAN has provided full-service engineering and manufacturing of custom electromechanical control actuation systems to guide missile fin position. FEMSAN's proven applications experience includes air-launched guided bombs and munitions, direct attack missiles, air defence, and naval defence missiles.

DefenceTurkey: The Brushless DC Motor Development Project signed on January 31, 2014, was one of the Technology Development Liability (TDL) projects coordinated by the

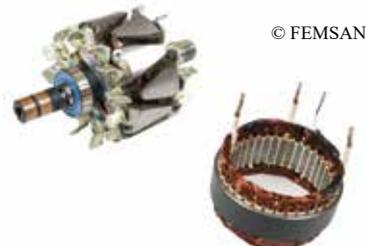


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Azimuth Axis Actuator for Machine Gun Platforms

you tell us about the indigenous weapons systems which incorporate FEMSAN product servo motors and actuation systems?

Melih Turan İPEKÇİ: FEMSAN designs and manufactures azimuth & elevation axis actuators for weapon systems on armored ground and naval vehicles. STAMP is only one sample of these kinds of applications. Weapon platforms require very compact actuators that



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Alternator for UAVs

Department of R&D and Technology Management Advanced Materials and Energy Group within the scope of procurement projects carried out by the Department of Weapon & Ammunition Systems and Roketsan as the main contractor. The aim of the project was to design, develop, test and manufacture slotless brushless DC motors with high efficiency for use in control actuation systems of guided missiles, especially anti-tank and air defence systems, instead of conventional slotted DC servo actuators. In this context, the Brushless DC motors (16 motors in 3 different types) to be designed and produced were intended to be used in different indigenous missile systems such



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Fin Actuation Systems

as the UMTAS and HİSAR-A/O and particularly the ATMACA Anti-Ship Guided Missile. Can we get information about the latest situation in the project?

Melih Turan İPEKÇİ: We carried out the work provided to us related these projects in 2016, and throughout 2017, these products were qualified for defence and aerospace successfully. In accordance with the project setup, all processes were monitored closely by the SSB and ROKETSAN. This led to the development of an indigenous, high-performance product family and Femsan was thus able to start meeting the specific requirements of Turkey's leading defence and aerospace companies. The slotless BLDC motors we developed are now used in the fin actuation systems of various types of ammunition.

DefenceTurkey: FEMSAN started the serial production of



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Slotless BLDC Motors



© Defence Turkey

Slotless Brushless DC Motors in the second half of 2018 after the completion of the R&D process. Thanks to their compact structure, these types of motors have been used for a long time in demanding projects where each gram is calculated. It is quite easy to see the fields of defence and aerospace as the primary users when we look at the usage areas of the slotless motors in the world. In our country, similar products have been used for a long time in our defence industry. What are the advantages of slotless DC motors over conventional slotted electric motors, which were the first ones to emerge in the industry, and why is it important for our country to gain this production capability?



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Rotary Servo Actuator for UAVs

Melih Turan İPEKÇİ: Slotless brushless motor designs offer many advantages over conventional slotted stator construction. Negligible magnetic cogging provides improved servo performance and enables extremely smooth motion even at low speeds. Low inductance and high current bandwidth results in fast motion response times. Slotless construction also provides excellent winding heat transfer for high thermal efficiency and transient load capacity. FEMSAN has a slotless motor family in the different diameters and qualifications

to compensate the customer's requirements with high power density and torque capacity as well as low volume. Producing slotless BLDC motors with indigenous possibilities was very serious. The greatest gain in production capability has been the creation of a competitive environment. There was no domestic alternative before and therefore the price policies of foreign firms have always been against us. We have already eliminated this situation.

DefenceTurkey: Looking out over the next 20 years, what will be FEMSAN's main capability/activity focus areas?

Melih Turan İPEKÇİ: There will be very serious changes in the world in 20 years. Everybody has focused on artificial intelligence. Autonomous air, land and naval platforms will be seen more often in the future. We think it would be right to focus on the needs in this area. Our highly reliable electromechanical actuators will be used to drive the various subsystems of unmanned aerial platforms. Our studies are about to finish in this area.

DefenceTurkey: What are your goals for the future of FEMSAN?

Melih Turan İPEKÇİ: FEMSAN aims to continuously pursue its investments in the coming years and to move forward to become one of the leading companies in its profession. Carrying its products and services a step further, moreover, to rise up to the status of "technology producer" ■



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Linear Actuator

Turkey: A Proven NATO-Standard Compliant Defence Industry Partner for MENA Region Countries

by İbrahim SÜNNETÇİ

Having one of the largest standing Armed and Security Forces in the world, with a Ministry of National Defence (MoND) budget of TL46,462.303 Billion (around US\$9 Billion) and a combined defence and security budget of around TL102,8 Billion (around US\$19,76 Billion based on the exchange rate of US\$1/TL5,2 on 6 February 2018), the Republic of Turkey is one of the leading regional powers in the Middle East & North Africa (MENA) region, which is facing major challenges and undergoing significant transformations

Turkish Defence & Aerospace Industry and MENA Region

Like many developing countries in the world, establishing a local, self-sufficient defence sector is of vital importance for Turkey. As an emerging force in the global defence market, Turkey during the last 17 years has embarked on a defence equipment policy, which puts the major emphasis on indigenous manufacturing and development. Through a determined pursuit of technology transfers and co-production contracts - when defence equipment from abroad is built in Turkey - the country has been able to build up a formidable industry. Thus, the Turkish Defence & Aerospace Industry has achieved remarkable progress in many areas over the last decade and is steadily increasing its efforts to become self-sufficient. The Turkish defence sector is now making its presence felt in the fields of land, air and naval platforms, as well as in defence electronics (including combat management systems) and weapon systems.

As a result of this progress, Turkey has turned out to be a significant manufacturer of state-of-the-art, NATO-standard compliant and cost-effective systems and equipment in the defence industry in recent years. Making its presence felt in the fields of land, air and naval platforms, as well as in defence electronics (including combat management systems) and weapon systems the Turkish Defence & Aerospace Industry is steadily increasing its efforts to become self-sufficient. According to

Turkish Minister of National Defence (MoND) Hulusi AKAR, local content ratio has reached a level of 68% in 2018.

Today, Turkey is developing and producing all kinds of systems, including the 5th Generation fighter jet TF-X, Advanced Jet Trainer & Light Attack Aircraft HürJet, 8-Ton Class (with 8.000kg MTOW and around 6.000 empty weight) national combat helicopter T129 Mk-II (ATAK-II), 6-Ton Class Light Utility Helicopter T625 GÖKBEY, AIP powered National Submarine (MilDen), National 3+ Generation MBT ALTAY, short medium and long-range air defence missile systems (HİSAR-A, HİSAR-O and HİSAR-U/SİPER) and the 533mm Heavy Weight Torpedo AKYA. MALE and Tactical Class UAVs in both Reconnaissance and Armed versions (ANKA, ANKA-S, BAYRAKTAR and KARAYEL), Self-Propelled Howitzers FIRTINA-I and FIRTINA-II, IIR+ Data Link Guided Long Range Anti-Tank Missile MIZRAK-U/UMTAS, Semi Active Laser Guided Laser UMTAS/MIZRAK-L and the Medium Range Anti-Tank Missile MIZRAK-O/OMTAS, Semi Active Laser Guided Missile CİRİT, Tactical Ballistic Missile BORA (export version named as KHAN), new generation air-to-ground cruise missiles SOM-A/B and SOM-J (F-35 JSF will be equipped with the SOM-J missile), ATMACA Block-I/II Anti-ship and Land Attack Missile, GökTürk-I/II EO Satellites, Simulation Systems, and the National Infantry Rifles (such as MPT-76, MPT-55). The are some of the products developed indigenously in recent years and are

already entering the service of the Turkish Armed and Security Forces.

As of the end of 2018, the Turkish Defence Industry's product portfolio features over 3.000 indigenously developed systems and subsystems, most of which have been designed, developed and produced by Turkish companies through R&D programs funded by MoND/SSB and the Scientific and Technological Research Council of Turkey (TüBİTAK).

Considering the fact that new generation international cooperation approaches like joint ventures rather than direct sales are now an absolute necessity in the field of defence, the Presidency of Defence Industries (SSB), the procurement authority under the Turkish MoND, has been encouraging local companies to establish joint ventures and partnerships with potential foreign companies in friendly and allied countries rather than seeking direct sales, as the majority of countries in Turkey's target markets are increasingly seeking local content and joint production. As part of this strategy Turkish defence companies have been acting as partners not as suppliers towards MENA and Asia-Pacific regions, which are among Turkey's target markets for the sale of defence products.

Having four firms (Aselsan [55th], Turkish Aerospace [61st], Roketsan [96th] and STM [97th]) in the world's 100 largest defence companies in 2018, the Turkish Defence & Aerospace Industry has been diversifying its exports away from Europe, where defence budgets are being cut - to Asia, the Middle

East and Africa, where expenditure is rising. Though Turkey is among the countries that have been greatly affected by the on-going adverse geopolitical conditions and changes that stem from the Arab revolutions and the ISIS terror due to its geographic proximity to the MENA region and the Arab world, is the fact that in the wake of the Arab Spring, Turkey's arms sales to the Middle East and North Africa have boosted. Middle East and North African countries have started to prefer state-of-the-art, NATO-standard compliant and much cheaper Turkish products over their Western-made equivalents. The strengths of the Turkish Defence & Aerospace Industry have been low cost, high quality, on time delivery and good after-sales service in those countries.

With the establishment of export promotion mechanisms, it is believed that the Turkish Defence & Aerospace Industry would become more competitive in foreign markets and gain speed in export sales. The SSB has already launched studies for the preparation of a new law to facilitate FMS (Foreign Military Sales) like credit mechanism to allow government-to-government transactions for defence products and services and currently also studying the barter mechanism. Turkey plans to sell its defence and aerospace products to some friendly countries, which experience shortage of funds, via barter deals. Under the barter deals defence and aerospace products would be exchanged with industrial goods, 'weapons for goods. If an FMS like credit mechanism is established and necessary legal arrangements for barter deals are realized, then Turkey's hand in the export market will be strengthened and thus will be able to offer very generous economic packages for defence sales like other competitors in its target markets. On the other hand, credit to be provided by Turk Eximbank, Turkey's official export credit agency, can be also utilized in financing the security programs. In 2018 Turkey granted credit packages to Pakistan to finance MilGem Corvettes and T129 ATAK Helicopters. Pakistan will pay the credits granted by Turkey, from its own budget and in installments in a



schedule extending out to 10 years.

To celebrate its 34th anniversary in November 2019 the SSB is now (as of December 2019) managing over 610 defence and security programs valued at over US\$60 Billion in the land, air, space, sea, electronics and weapon systems areas for the TAF, SGD (Turkish National Police) and other Governmental Organizations including but not limited to General Directorate of Forestry and General Directorate of Mineral Research and Exploration (MTA). In 2008 the SSB was managing 194 projects valued at US\$19 Billion with a local content rate of 44%.

Exporting its defence products to over 60 countries around the world Turkey is targeting to become a top six country in the world in terms of defence and aerospace exports, and to reach a total of US\$25 Billion (including US\$10 Billions for the civilian aviation sector, US\$5 Billion for Maintenance Repair and Overhaul [MRO] services, US\$5 Billion for security system sales and US\$5 Billion for defence industry sales) of exports by 2023, the year that will mark the first centennial of the Republic of Turkey.

Importance of the MENA Region for Turkey

Considering the fact that exports play an important role in establishing a sustainable and competitive defence industry, the SSB attaches the utmost importance to exports and remaining internationally competitive in the defence sector.

Turkey has already expressed its interest in expanding bilateral military cooperation and bolstering defence industry ties with the Middle East and North African countries as part of its efforts and policy to boost its defence industry cooperation with Islamic states.

As part of its export strategy, the SSB decided to open Defence Industry Cooperation Offices, acting as liaison offices, arranging contracts between local authorities and Turkish companies, in priority target areas for the export of Turkish defence products. In this context for example Defence Industry Cooperation Office in Riyadh, Saudi Arabia was opened in March 2011 and the UAE office (at the Tawazun Headquarters in Abu Dhabi) in December 2012. In order to create awareness in the MENA region of the Turkish Defence & Aerospace Industry's capabilities, the SSB has been supporting national participation in defence exhibitions in the MENA region. In this context Turkey participates in important defence and aerospace exhibitions organized in the MENA region such as IDEX/NAVDEX (UAE), DIMDEX (Qatar), SOFEX (Jordan), Bahrain International Air Show (BIAS) and Africa Aerospace & Defence (AAD, South Africa) and key players from the Turkish defence sector are brought together in a national pavilion. Defence and aerospace exhibitions provide the necessary atmosphere for the demonstration of Turkish defence sector capabilities and the encouragement of security and defence cooperation with regional countries.

In order to strengthen the existing cooperation and collaboration in the defence industry fields between Turkey and the MENA region countries, MUSIAD (Independent Industrialists' Businessmen's Organization) and the SSB have decided to organize country specific exhibitions in selected countries. In this context as the Turkish Defence & Aerospace Sector's first event, aimed at one specific country, High-Tech Port by MUSIAD Qatar, a high level, advanced and strategic technology exhibition, was organized during October 6-8th, 2015 in Doha under the auspices of Turkish President Recep Tayyip ERDOĞAN and the Emiri of Qatar Sheikh Tamim Bin Hamad Al-Thani. 75 Turkish and Qatari companies showcased their latest innovations in the defence industry at the High-Tech Port by MUSIAD Qatar. During the Armed Forces Exhibition for Diversity of Requirements and Capabilities (AFED 2018), which was held in the Saudi Arabia capital Riyadh between February 25 - March 3, 2018 Turkey, the guest-of-honor country has shown keen interest in working closely with Saudi Arabia to build Saudi defense capabilities. A total of 24 top-notch Turkish companies displayed a large number of products, including military hardware, missiles, loitering munitions, RCWSs and service components, at the exhibition.

Turkish President Recep Tayyip ERDOĞAN paid official visits to Gulf countries Bahrain, Saudi Arabia and Qatar on February 12-15, 2017. The then Chief of Turkish General Staff (TGS) General Hulusi AKAR, MoND Fikri IŞIK and President for Defence Industries (SSB) Prof. İsmail DEMİR accompanied President ERDOĞAN during his visits. All aspects of bilateral relations and defence industrial cooperation as well as regional and international issues were addressed in depth during the visits, which further deepened Turkey's cooperation with Bahrain, Saudi Arabia and Qatar both at the bilateral and multilateral level such as the Gulf Cooperation Council and the Organization of Islamic Cooperation.

In June 2017, a handful of Arab states, led by Saudi Arabia, abruptly severed diplomatic relations with



Turkish Military Base in Qatar

Qatar and imposed a blockade on the tiny Gulf country, accusing it of supporting terrorism. The Qatari Government has denied the accusation, blasting the blockade as unjustified and a violation of international law. Amid the rift, Turkey has provided an increased support to Qatar, boosting food and other exports to meet any shortages.

During mid-August 2018 the Emiri of Qatar Sheikh Tamim Bin Hamad Al-Thani visited Ankara to show his country's support for Turkey, pledging US\$15 Billion in direct investments in the country that found itself embroiled in a crisis with the US, which saw the lira's value fall drastically against the dollar. Just days after the meeting between the leaders of the two countries, Qatar and Turkey's central banks inked a currency swap agreement to provide liquidity and support for financial stability. On October 15, 2018 Qatari Minister of State for Defence Affairs Khalid bin Mohammed Al-Atiyya met Turkey's President Tayyip ERDOĞAN in the presidential palace in Ankara. They discussed the mutual relations between the two countries, and "the latest developments in the region". On November 26, 2018 the 4th meeting of the Turkey-Qatar Supreme Strategic Committee, chaired by President Recep Tayyip ERDOĞAN and the Emiri of Qatar Sheikh Tamim Bin Hamad Al-Thani, was held in Istanbul. Speaking at the meeting, President ERDOĞAN stressed the importance of Turkish-Qatari ties and expressed his content with the level of relations at a time when the two countries

are celebrating their 45th year of bilateral ties. The Supreme Strategic Committee between the two countries was established in 2014 as a bilateral mechanism for high-level dialogue and cooperation. The first meeting of the committee was convened in Doha in December 2015, while the second took place in Trabzon in December 2016 under the chair of the two leaders. The third of the meetings took place in Doha in November 2017. During those meetings, various agreements, protocols and memoranda of understanding were signed, further strengthening Turkey's relations with Qatar.

The 21st meeting of Turkey-Tunisia Defence Industrial Cooperation was held during March 21-24, 2017 in Ankara. On December 27, 2016 Security Protocol was signed between Guinea and Turkish MoND at Presidential Palace in Ankara.

Turkey also sets up military bases in Qatar and Somalia to expand bilateral military cooperation with these countries. Turkey has set up a military base in Qatar, as part of defence agreement between the two countries. Establishment of the base, part of an agreement signed in October 2014 and ratified by the Turkish Parliament (TBMM) in June 2015, intensifies the partnership with Qatar. The new Turkish base in Qatar, represents Turkey's first overseas military installation in the Middle East. The first batch of Turkish troops arrived in capital Doha on October 4, 2015, and the Turkish flag was raised at the military base four days later. The establishment of the Turkish military

base in Doha was completed in April 2016. According to reports the base has a capacity to accommodate up to 5,000 troops and Turkey plans to gradually increase the number of its forces in Qatar to 3,000 in accordance with the agreement between the two countries and keep a brigade in the Gulf country. As part of his official visit to Qatar on November 15, 2017 ERDOĞAN paid a visit to the Turkish military base in Doha and urged the troops to conquer the hearts of the Qatari people.

Meanwhile in March 2018 it was revealed that Qatar signed an agreement with Turkey to establish a naval base. The agreement came during the Doha International Maritime Defence Exhibition and Conference (DIMDEX) 2018. Turkey won a tender to establish the base in northern Qatar, General Hamad Bin Abdullah Al-Futtais Al Marri, Commander of Qatar's Joint Special Forces said. The new naval base will include a training center that will primarily take on maritime patrols and monitoring. No other details of the base were revealed.

Turkey has set up its biggest overseas military base in the Somali capital, Mogadishu to help train the Somali National Army to fight Al-Shabaab terrorist organization. The base was officially opened in September 30, 2017 Saturday with the participation of the then Chief of Turkish General Staff General Hulusi AKAR. "This is the largest training base of its kind outside of Turkey. The Government of Turkey and its Army will provide all the needed support to our brothers in Somalia," Gen. AKAR said at the ceremony. Under construction since 2015, the base, which reportedly cost US\$50 Million and spread over four square kilometers, will train 10,000 Somali troops and has the capacity to train at least 1,500 soldiers at a time, according to Turkish and Somali officials. The new base also takes on an urgent significance as the 2020 withdrawal deadline for the 22,000 African Union multinational force gets closer. The base has been approved by the United Nations and will serve as Turkey's second overseas base, after the first opened in Qatar in April 2016. Turkey, which has been aiding Somalia with military support for



Turkish Military Base was inaugurated in Somalia on September 30, 2017

the last six years, also donated over US\$400 Million to help end hunger in the country. According to Turkish MoND some 450 MPT-76 infantry rifles have already been delivered to Somalia.

Turkey's Exports to the MENA Region

Emerging as a new arms exporter that can provide more efficient, low cost, combat proven, and less problematic products for arms buyers, the Turkish Defence & Aerospace Industry has increased exports by 17,1% during January-December 2018 compared to the same period last year. This is the first time defence exports from Turkey exceeded US\$2 Billion level. According to export figures revealed by the Turkish Exporters' Assembly (TIM), on January 1st, 2019 during January 1st – December 31st of 2018, the Turkish Defence & Aerospace Sector exported a total of US\$2,035.334 Billion, while the said figure was at the US\$1,738.512 Billion level for the same period of last year. According to TIM's data the list of the top 15 countries that imported defence and aerospace products from Turkey during January 1st – December 31st of 2018 is composed of; the US, Germany, Oman, Qatar, the Netherlands, India, Azerbaijan, the UK, Poland, France, UAE, Ukraine, Spain, Senegal and Bangladesh.

According to TIM's figures during January 1st – December 31st of 2018, the Turkish Defence & Aerospace Industry exported US\$744,738 Million (which was

at the US\$708,577 Million level during the same period last year) in defence and aerospace equipment to North America/US, and US\$549,393 Million (which was at the US\$498,847 Million level during the same period last year) to EU Member Countries, around US\$31,180 Million to other European countries, around US\$310,647 Million (which was at around the US\$131,352 Million level during the same period last year, rising 136.36% compared to 2017) to Middle East countries, around US\$118,303 Million (which was at the US\$91.540 Million level during the same period last year) to the Commonwealth of Independent States (CIS), around US\$120,470 Million (which was at the US\$141,718 Million level during the same period last year) to other Asian countries, around US\$84,349 Million (which was at the US\$63,790 Million level during the same period last year) to African countries and around US\$51,895 Million (which was at the US\$71,026 Million level during the same period last year) to countries in the Far East.

With a total of around US\$153,373 Million (which represents a 1,046.43% increase compared to the same period last year, one of the largest in terms of the rate of increase, mainly stemming from FNSS PARS III ACV deliveries to the Royal Omani Army), Oman was the largest recipient/importer from the MENA region in 2018, followed by Qatar with around US\$83,454 Million (which represents a 240.85% increase compared to the same period last

year and believed to stem from wheeled armored vehicles and fast intervention boats sales/deliveries to the Qatar Emiri Armed Forces), UAE with US\$35,278 Million (which represents a 376.35% increase compared to the same period last year, mainly stemming from Otokar's RABDAN 8x8 III ACV deliveries to the UAE Army), Senegal with around US\$26,867 Million (which represents a 3,819.23% increase compared to the same period last year, the largest one in terms of the rate of increase), Burkina Faso with US\$18,103 Million, Chad with US\$10,080 Million and Saudi Arabia with US\$8,324 Million.

During DIMDEX 2018, which was held at the Qatar National Convention Center in Qatar's capital Doha on March 12-14, Turkey's leading defence & aerospace companies won contracts worth US\$800 Million, of which around US\$500 Million went to Turkish private shipyards. Turkey notably increased its arms exports (specifically armored vehicles and naval vessels/boats) to the MENA Region, one of the major markets for Turkish Defence & Aerospace Sector sales, during 2013 - 2018 and this trend is expected to last in 2019.

According to export figures revealed by the TIM on February 4th, 2019, the Turkish Defence & Aerospace Industry's total arms exports amounted to US\$175,083 Million in January 2019, which represents a 64.4% increase compared to January 2018. However, it also represents around a 30% decrease compared to December 2018. In December 2018 the Turkish Defence & Aerospace Industry's arms exports amounted to US\$253,496 Million. According to TIM's data the list of the top 12 countries that imported defence and aerospace products from Turkey in January 2019 is composed of; the US (US\$64,226 Million), Oman (US\$49,486 Million), Germany (US\$18,489 Million), the Netherlands (US\$7,661 Million), Poland (US\$5,362 Million), Qatar (US\$4,620 Million), the UK (US\$2,820 Million), France (US\$2,651 Million), Bahrain (US\$2,270 Million), Belgium (US\$1,620 Million), Saudi Arabia (US\$1,314 Million) and Canada (US\$1,304 Million).



Two FIRTINA Self-Propelled Howitzers and 171 Turkish Soldiers were arrived in Doha for joint military exercise on 8 October, 2017

Meanwhile, speaking at the Aselsan Union of Forces Summit held on February 5, 2019 at the ATO Congression Center in Ankara, Turkish MoND Hulusi AKAR, formerly Chief of the Turkish General Staff, disclosed that Turkey has recently signed a contract with Qatar for the sale of FIRTINA Self Propelled Howitzers (SPHs). MoND AKAR did not share any figure about the number of FIRTINA SPHs to be delivered to Qatar Emiri Armed Forces (QAAF). It is believed that the contract covers the New Generation FIRTINA (also dubbed FIRTINA-II) SPHs, which are under production at 1st Main Maintenance Factory Directorate located in the Sakarya province of northwest Turkey.

On December 14, 2018 Aselsan secured a contract valued at US\$194,6 Million to deliver Fire Control Systems for the 140 FIRTINA-II SPHs ordered for the Turkish Land Forces Command. Upon the Decree signed by President ERDOĞAN on December 10, 2018 and published on the Official Gazette on December 20, 2018 the 1st Main Maintenance Factory Directorate, Turkey's top Main Battle Tank maintenance and modernization factory was transferred to BMC, a joint Turkish-Qatari venture that manufactures armored vehicles. Under the deal, BMC will make an initial investment of US\$40 to US\$50 Million to modernize the MBT assembly and production unit. BMC plans to convert the military factory into a serial production unit for the ALTAY MBT, Turkey's first indigenous, new-generation MBT. The plant will be under lease to BMC for a period of 25 years, according to the deal.

The lease price for the factory has not yet been publicized. In October 2018 it was reported that after receiving assurance that there would be no export restrictions state-owned Machines and Chemical Industries Board (MKEK) signed a contract to procure 20 powerpacks (including 5TDFMA-1 engines) from UkrOboronProm (Ukrainian Government's Defense Industry Enterprise) for the FIRTINA-II SPHs. Probably these 20 powerpacks would be installed at QAAF's FIRTINA-II SPHs.

A Look at Turkish Companies in the MENA Market

Starting from 2010 in an effort to increase defence cooperation with Islamic countries, Turkey has turned its attention to the Middle East and North Africa to export fast intervention boats, rockets/missiles, ammunition and armored vehicles. During recent years, leading Turkish companies such as Anadolu Shipyard, Aselsan, ARES Shipyard, Baykar Makina, BMC, FNSS, Havelsan, Meteksan Defence, Nurol Makina Sanayi (NMS), Otokar, Roketsan, Turkish Aerospace (TUSAS), TEI, Vestel Defence and Yonca-Onuk JV have been quite active particularly in the Middle East and Gulf countries. Acting as partners not suppliers towards MENA region countries, Turkish defence sector companies have dramatically increased their exports and have started to sign high-value export contracts, thanks to the proactive foreign policy, aggressive marketing efforts and state-of-the-art, NATO-standard compliant and cost-effective products.

Anadolu Shipyard

During the DIMDEX 2018 Exhibition the Qatar Emiri Naval Forces placed an order for two Cadet Training Ships (CTS) to the Turkish private shipbuilder Anadolu Shipyard. According to Anadolu Shipyard, the 90-meter vessels will displace 1,950 tons and feature a helipad for a medium-size helicopter. The vessels will have the capacity to provide training for up to 72 naval cadets and are scheduled to be delivered in 36 months. They are also set to be capable of performing offshore patrol duties.

Meanwhile during DIMDEX 2018, Piri Reis University, a maritime institution, also signed an agreement to establish an academy for the Qatar Emiri Naval Forces and MDS Defence Technologies secured a contract for the construction of a training center for the Special Forces Command of the Qatar Emiri Naval Forces.

Aselsan

Aselsan established in 1975 as a communication electronics company, has grown into the largest defence electronics company in Turkey, one of the 100 largest companies (55th in 2018) in the world. Under a contract awarded in 2009 Aselsan sold 150 STAMP (armed with 12.7mm M2HB) and STAMP-G (armed with GAU-19/A gun) Remote Controlled Stabilized Naval Weapon Systems to the UAE for the naval platform applications. The first batch of the STAMP systems have been delivered by Aselsan and the remaining systems are assembled and were delivered by new JV company IGG Aselsan Integrated Systems (established under an agreement signed between Aselsan and its local partner International Golden Group [IGG]) to the UAE Navy and CNIA. IGG Aselsan Integrated Systems' production facility is located in the Industrial City of Abu Dhabi. Deliveries were completed in 2015 and 34 of the STAMP Systems were integrated on MRTP16 Class Fast Intervention Boats delivered by Yonca-Onuk JV of Turkey to UAE's Critical National Infrastructure Authority (CNIA). Aselsan also hopes to sell 50 STOP/MUHAFIZ



30mm STOP/MUHAFIZ and STAMP-G Naval Weapon Systems

(with 30mm Mk44 Bushmaster II automatic cannon) Remote Controlled Stabilized Naval Weapon Systems to the UAE.

Aselsan also secured a contract from Egypt for the delivery of a number of STAMP-G (with GAU-19/A gun) systems to be integrated on MRTP20 boats of the Egypt Naval Forces. Aselsan already completed the delivery of three 12.7mm STAMP and three 30mm STOP/MUHAFIZ Remote Controlled Stabilized Naval Weapon Systems to Qatar Navy and they were integrated on Yonca-Onuk's MRTP16 and MRTP34 Class Fast Intervention Boats. Aselsan also delivered a further six 12.7mm STAMP Systems to Qatar and they were integrated on six MRTP20 boats ordered during DIMDEX 2016. Aselsan's 12,7mm STAMP and 30mm STOP/MUHAFIZ Systems are also being integrated on 17 HERCULES Fast Patrol Boats (five 24m ARES 75, 10 34.5m ARES 110 and two 48.5m ARES 150) ordered in March 2014 by Qatari Coasts and Borders Security Department to ARES Shipyard. An agreement regarding the procurement of 12,7mm STAMP and 30mm STOP/MUHAFIZ Remote Controlled Weapon Systems for the needs of the Qatar Coast Guard Command was signed between Aselsan and ARES Shipyard on December 28, 2016. Under the €20 Million contract the deliveries were scheduled to be completed in 2018. Aselsan also

exported undisclosed number of SARP RCWSs to Qatar and some of them were integrated on Renault VAB 4x4 Wheeled Armored Vehicles in Qatar Armed Forces service.

On June 8th, 2018 Aselsan secured around US\$150 Million contract from Nurol Makina to deliver undisclosed number of SARP RCWSs, Kornet-E ATGM Launcher System and IGLA SAM Launcher Systems to equip Qatar Emiri Special Forces' NMS/YORUK 4x4 Wheeled Armored Vehicles (WAVs). Under a contract awarded during DIMDEX 2018 Fair, Nurol Makina will deliver 214 NMS/YORUK 4x4 WAVs to Qatar Emiri Special Forces. During Aselsan facility tour that took place on May 7, 2018 Aselsan Deputy General Manager Mustafa KAVAL disclosed that Aselsan manufactures 7 SARP RCWSs per day and around 150 in month and as of May 7, 2018 1.458 SARP/Dual SARP RCWSs have been manufactured, 10% of them were export customers such as Kazakhstan and Qatar.

Meanwhile under a contract awarded by the Qatar MoD, during the first half of 2018 Aselsan completed the delivery of Integrated Mobile Border Security System to the Qatar Emiri Armed Forces (QAAF). The System includes a tactical vehicle based on Mercedes Benz fitted with ACAR Land Surveillance Radar, ARYE E/O Sensor Systems and SECANS Security Management Software.

Also, at DIMDEX 2018, Aselsan have signed a technology transfer deal with Qatari military technology firm Barzan Holding, covering the establishment of a joint venture 'BARQ' (Arabic for "lightning") in Qatar for the local production of Aselsan's stabilized remote weapon systems and electro-optical reconnaissance and surveillance systems for the QAAF.

Aselsan Middle East (AME), a JV company of Aselsan and KADDB Investment Group of Jordan, has delivered a total of 100 SAGER thermal sight systems to Royal Jordan Army to upgrade existing Kornet-E ATGMs by providing them night-time surveillance and engagement capability. In 2016 AME has delivered undisclosed number of Night Vision Systems including A100 Night Vision Monoculars and A340 Night Vision Weapon Sights under a Night Vision Contract awarded in 2015. Company also delivered undisclosed number of Pilot Night Vision Goggles to Royal Jordanian Air Force and communication systems for MBOMBE Wheeled Armored Vehicle. In 2017 AME started local manufacture of Laser Guidance Bomb Kits under Aselsan license in Jordan. Aselsan in cooperation with local partner KADDB also working on the development of Remote-Controlled Stabilized Weapon Systems, Quad Kornet Launcher and Mini UAS. According to Aselsan 2016 Activity report, in 2015 Aselsan have delivered 1,033 A341 and 398 A361 Night Vision Weapon Sights in kits as well as 56 SAGER Thermal Sight to AME factory. Aselsan will provide technology transfer to Jordan for the local production of software defined VHF/UHF radios. In this context production line for the local manufacturing of software defined radios has been planned to be established at AME facilities.

In November 2015, Taqnia Defence and Security Technologies (DST), a subsidiary of Saudi development and investment company and Aselsan have signed a term sheet for the formation of a JV company in the Kingdom of Saudi Arabia (KSA). Within the scope of the agreement, Taqnia DST (50%) and Aselsan (50%) has created a Joint Venture Company to operate in the field of Radar,



© Defence Turkey

BARQ Booth in DIMDEX 2018

Electronic Warfare and Electro-Optic technologies and to support the transition of the Kingdom to knowledge-based economy. On February 21st, 2016 Shareholders Contract was signed between Taqnia DST and Aselsan and in December 2016 SADEC LLC (Saudi Defence Electronics Company) was officially established. SADEC was formed with an initial US\$6 Million investment to market Aselsan's range of electronics, such as radar, electronic warfare (EW) systems and electro-optical and infrared (EO/IR) sensors in Saudi Arabia. SADEC LLC became operational in January 2017. Construction of the manufacturing facilities (to be the scaled version of Aselsan REHIS facilities in Gölbaşı, Ankara) was completed during the second half of 2017 and the facility was officially

inaugurated on December 14, 2017.

In KSA, within the framework of an agreement signed with the local King Abdulaziz City for Science and Technology (KACST) organization, the studies initiated with technology transfer for the local development of an indigenous waveform for Aselsan software-based radios have been completed and KSA-unique new waveform has been tested successfully on an Aselsan-built software defined radio. Following this success discussions and negotiations conducted for the local production of Aselsan's VHF/UHF software-defined radio sets in KSA. For this purpose, new company (Military Industries Corporation SDR) and a production facility (with 5,000m² closed area) have been established at Riyadh in 2015. As of June 2016, prototype



© Defence Turkey

Laser Guidance Kit (LGK)

production of PRC-9651 and VRC-9661 Series handheld and vehicular multi-band, multi-mode radio sets (200 sets) have been completed. In December 2016 Military Industries Corporation SDR facilities was officially put into service with the participation of SSB Prof. İsmail DEMİR and high-ranking Saudi officials. So far Aselsan secured three contracts from KSA for the production of software defined radio sets. First contract valued at US\$85 Million was awarded in November 2013 was covering the local manufacture/assembly of 3,000 VHF/UHF software-defined radio sets (in handheld, manpack and vehicular configurations).

Meanwhile according to Aselsan, the company has submitted a proposal valued at US\$1 Billion to undisclosed country for the delivery (and probably for the local production) of undisclosed number of Laser Guidance Kits (LGK). This undisclosed country is believed to Saudi Arabia. According to Aselsan Almanac 2017 document the company has performed successful live firing tests for demonstration purpose in Saudi Arabia with LGK-82s (for Mk-82 500-lb/336.79kg general purpose bombs) in October 2017. "During firing tests performed by Royal Saudi Air Force (RSAF) in Saudi Arabia targets have been hit successfully," stated in the Almanac 2017. In February 2018, Lockheed Martin has joined hands with Wahaj, a subsidiary of Saudi International

Petrochemical Company (Sipchem) to set up a production unit for its Paveway II Plus Laser Guided Bomb (LGB) mechanical parts in Saudi Arabia. The foreseen production package was said to cover three configurations GBU-10 (Mk-84 2.000-lb/907.18kg), GBU-12 (Mk-82 500-lb/336.79kg) and GBU-16 (Mk-83 1.000-lb/453.59kg).

Aselsan is also taking part in the avionics modernization of Royal Bahraini Air Force (RBAF)'s AH-1E Cobra Attack Helicopters, being carried out by TUSAS.

ARES Shipyard

On September 9th, 2013 ARES Shipyard announced that it had won a contract from Bahrain Coast Guard to build and deliver 6 18m-patrol boats from advanced composites. Number of boats later increased to 12 and first boat delivered in January 2014. Deliveries were completed in 2015.

Following a tough competition with 18 international shipyards ARES Shipyard secured a US\$55 Million contract on March 26, 2014, to deliver a total of 17 HERCULES Fast Patrol Boats from advanced composites in three configurations (five 24m ARES 75, 10 34.5m ARES 110 and two 48.5m ARES 150) to the Qatari Coasts and Borders Security Department. Deliveries started in October 2016 and scheduled to be completed by mid-2019. In December 2017, the handover ceremony was held for

the ARES 150 HERCULES (QC901) Offshore Patrol Vessel which is 48,5m meters in length and the ARES 110 HERCULES (QC812) Fast Patrol Boat which is 34,5 meters in length, with the participation of officials from the Qatari Coasts and Borders Security Department and the Ministry of Interior in Antalya.

During DIMDEX 2018 ARES Shipyard, received a follow-on contract to deliver three 48,5m ARES 150 Offshore Patrol Vessels and six 24m ARES 80 Special Operation Boats, to be armed with Aselsan's 12,7mm STAMP and 30mm STOP/MUHAFIZ Remote Controlled Stabilized Naval Weapon Systems. With this order the total number of ARES Shipyard boats to enter Qatari Coasts and Borders Security Department by the end of 2020 has been increased to 26.

HERCULES FPBs are armed with Aselsan's STAMP and STOP/MUHAFIZ Remote Controlled Stabilized Naval Weapon Systems. ARES Shipyard also secured a contract from a Qatar state tourism company for the construction of 18 (8+10) ARES 17 CF luxury passenger ferries. First two boats were delivered in April 2014 and deliveries of the first batch of 8 ferries completed in January 2015. Company also manufactured two 30m FPBs with aluminum hull and superstructure for the Nigerian Customs Service. Dubbed the 'KND30' the FPBs are each powered by three 1,100 horsepower Caterpillar engines



giving the boats a top speed of about 30 knots. Deliveries of KDN30 FPBs to Nigerian Customs Service completed in 2015.

On November 13, 2018 ARES Shipyard announced that it has been awarded a contract to supply 14 ARES 85 HERCULES multi-role patrol boats to the Royal Oman Police Coast Guard (ROPCG). The contract was signed between the Inspector General of Royal Oman Police (ROP) and the General Manager of ARES. This is Turkey's first naval vessel supply contract with Oman. Deliveries are scheduled to be completed within four years. The ARES 85 HERCULES vessels are fully customized to meet the ROPCG's needs and provide the agency with a much-expanded capability to patrol and secure the nation's waters. The vessels have an overall length of 25,95m, a beam of 5,85m, a draught of 1,20m and a displacement of 70 tons. To be built by Fibre Reinforced Plastic (FRP) composites the ARES 85 HERCULES boats will have a maximum speed of 45+ knots.

Baykar Makina

During DIMDEX 2018 Baykar Makina secured a contract for the delivery of three BAYRAKTAR TB2-S Armed UAV Systems with six aircraft, FLIR payloads, three Ground Control Stations and a UAV Training Simulator to Qatar Emiri Air Forces Reconnaissance and Surveillance Centre Command, within one-year schedule. BAYRAKTAR TB2-S Armed UAVs will carry Roketsan's MAM-L and MAM-C smart munitions. Under the contract Baykar Makina will also set up a UAV Operation Center and network-based data tracing and archiving software for the Qatar Emiri Air Forces. Baykar Makina will provide UAV Pilot, Payload (probably CMX-15) and Maintenance training to Qatar Emiri Air Forces personnel, who will fly BAYRAKTAR TB2-S Armed UAVs, in Turkey. Baykar Makina will provide 2-year logistic support to Qatar Emiri Air Forces for the operation of BAYRAKTAR TB2-S Armed UAVs. The Factory Acceptance Tests (FAT) phase for the six BAYRAKTAR TB2-S Armed UAVs and three Ground Control Stations



55 Qatari trainees have successfully completed the training program in January 2019

were completed in January 2019, meanwhile training of the Qatar Emiri Air Forces personnel at Keşan, Edirne which lasted 4 months has been completed and 55 Qatari trainees (pilots and maintenance personnel) have graduated from the training program.

BMC

In late 2013, the Tunisian MoD awarded an undisclosed value of contract to BMC for the procurement of 40 BMC 350-16Z KIRPI Mine Protected Tactical Wheeled Vehicles. Deliveries completed in two batches during 2014. First batch 20 vehicles were delivered in February 2014 and the second batch in July 2014. 10 of these vehicles were equipped with Doodam RCWS. In 2015 Tunisia placed a follow-on order for further 101 KIRPI MRAPs in various configurations including 4

ambulance vehicles. Some of the vehicles are equipped with passive RPG protection system (AmSafe Bridport's TARIAN). BMC will also deliver 40 KIRPI MRAPs to Qatar all of them to be equipped a Dodaam RCWS. Some 49% of BMC has been sold to a Qatari company QAFIC in June 2014.

During Doha International Maritime Defence Exhibition and Conference (DIMDEX 2018), which was held at the Qatar National Convention Center in Qatar's capital Doha on March 12-14, 2018, BMC secured a contract to deliver 50 KIRPI-II MRAPs and 35 AMAZON 4x4 Multipurpose WAVs to Qatar. Deliveries were expected to be completed by the end of 2018. According to news dated December 2018, BMC has been in talks with Qatar for the delivery of up to 1,500 armored vehicles including KIRPI MRAPs and AMAZON 4x4 Wheeled Armored Vehicles.



Tunisian KIRPI MRAP

Roketsan

The late 1990's, Roketsan initiated negotiations with the UAE Armed Forces and secured its first contract to procure 122 mm rockets and weapon systems and the contract was eventually signed by the parties in 2001. This first contract enabled both parties to understand each other and build a strong base for future programs. With this strong and promising relationship, Roketsan began developing unmatched new systems designed for specific requirements for the UAE Armed Forces and delivered two different types of the JOBARIA Multi Cradle Rocket Launcher (MCRL) systems.

In August 2018 Roketsan took part in the military vehicle category in the Guinness World Records Book, with the JOBARIA Multi Cradle Rocket Launcher System, which can launch 240 122-mm rockets, 2 minutes at a time.

Following the successful completion of these programs, Roketsan signed another contract with Burkan Munitions Systems (BMS), a local company licensed for explosives and mechanical parts production, for co-production of artillery rockets in the UAE. In the scope of this contract, technology provided the necessary infrastructure to the UAE for national programs.

In mid-2012, Roketsan began negotiations with Tawazun, a UAE based investment company, regarding the possibilities of a 2,75 Laser Guided "CİRİT" and related cooperation models. With the great spirit and significant effort of both parties as a team, Roketsan was successful in reaching a contract agreement early in 2013 for a very large number of procure of "CİRİT" missiles. Furthermore, the contract also comprised the integration of "CİRİT" to the UAE's specified platforms such as the UAE Army's Air Tractor AT-802 Surveillance and Light Attack Aircraft, Fast Patrol Boats and Land Vehicles.

At the IDEX 2013, Roketsan and Tawazun announced a contract which was valued at US\$ 196 million, in order to cater to the requirements of the UAE Armed Forces, Thus, UAE was first export customer for the CİRİT 2,75 Guided



JOBARIA MCRL systems was displayed first time at IDEX 2013 in Abu Dhabi, UAE

Laser missile systems. Within the scope of this huge contract, Roketsan has completed on-time delivery of a great number of Laser Guided CİRİT missile deliveries to the UAE.

FNSS Defence Systems

As the very first defence systems exporter (signed an agreement for ACV 350 Dhabyan vehicles with the UAE back in 1998) out of Turkey, FNSS has achieved a lot of firsts during last decade. Having awarded series of contracts in Kingdom of Saudi Arabia (KSA) for the modernization and upgrade of several hundreds of M113 Armored Personnel Carriers (APCs) into the M113A4/ACV350 APC configuration, FNSS is now operating their army factories, which was another first in the Turkish defence sector. FNSS' position in KSA did not occur immediately. It took a while for FNSS to build trust

and find a stable position within the country. Following the success of the first agreement, five more contracts followed immediately covering the modernization of a total of more than 1,000 M113 vehicles with a total value of around US\$1,5 Billion.

FNSS's history with KSA goes back approximately 15 years. Under the M113 APC Conversion Program FNSS received the first contract in 2004, covering the upgrade of 34 M113A1/A2 vehicles into M113A4/ACV350 APC level, and a follow-on contract valued at US\$210 Million was signed in 2007 for the upgrade of further 300 M113s. Under the Conversion Program FNSS also took over the maintenance activities and operation of the Al Kharj Maintenance & Upgrade Center (MUC), located 80km from Riyadh. The facility, owned by the Saudi Ministry of Defence and Aviation (MoDA), has been



Modernized M113 Vehicles



FNSS PARS-III 8x8 WAV

operated by FNSS for over 12 years now under a Government Owned-Company Operated (GoCo) model, in cooperation with local company Al Esnad Military Supplies. Valued at US\$324 Million and awarded in November 2010 the third contract under Conversion Program was covering not only the upgrade of further 312 M113 APCs but also technology transfer, training and Integrated Logistics Support (ILS). Modernization work was carried out at the Al Kharj MUC. On December 10, 2013 FNSS announced that it had signed a US\$360 Million contract with a Middle East country (Saudi Arabia) for the modernization of M113 APCs. In KSA FNSS is in the fifth and sixth consecutive contracts. As of October 2016, the modernization of 996 M113s in nine different configurations have been completed. Because of the continuous contracts with this country, KSA becomes the company's 'Home Market'. Considering the fact that KSA is currently engaged in a serious conflict with Yemen and certain emergency defence procurements have taken precedence over other requirements there is a chance for FNSS to strike another deal with KSA. According to FNSS officials, the budget allocation is in the process for the next phase of the M113 Conversion Program. Since there is a need for other types of armored vehicles in the upcoming months, the company is expected to find an opportunity to sign an even-larger contract in KSA.

During the second half of 2015

FNSS received around US\$500 Million contract from the Royal Army of Oman (RAO) and the Ministry of Defence of the Government of the Sultanate of Oman to design, develop, manufacture, qualify (both international and customer) and deliver a total of 172 PARS-III Wheeled Armored Vehicles (WAVs) in 13 variants and the contract became effective on September 20, 2015. Contract period is expected to be finished in May 2020. This contract represents the second export order for the PARS WAV following Malaysia. RAO PARS-III 8x8WAVs feature some country specific modifications and upgrades and have slightly different appearance compared to PARS-II/AV-8 Gempita vehicles of the Malaysian Army. On the contrary to PARS-II/AV-8 vehicles, the RAO PARS-III WAVs does not have swimming capability but in return they have better ballistic and mine/IED protection thanks to add-on armor modules. The official delivery of the first PARS-III WAV to the RAO took place on July 12, 2017 at the FNSS facilities located in Gölbasi, Ankara/Turkey.

FNSS has also previously modernized and upgraded AIFV and M113 vehicles for Bahrain Defence Force and M113 vehicles of the Royal Jordanian Army.

Havelsan

In December 2012 Havelsan secured around US\$49 Million contract for the establishment of an AW139 Helicopter Simulator

Training Center in Qatar for Qatar Emiri Air Force. Under the contract Havelsan designed, developed and delivered one AW139 Full Mission Simulator (FMS), one Flight and Navigation Procedures Trainer, one Cabin Crew Trainer Simulator, a Debriefing System and a Tactical Control Centre for AW139 Helicopters. The all-weather AW139 FMS provides high-resolution satellite imagery of Qatar's 11,000km² land and medium-resolution imagery for the entire Gulf area. In addition to these AW139 Simulator Training Center (TCC), which will be operated by Havelsan, will also include Computer Based Training Classes, Debriefing Rooms and Infrastructure Facilities. As part of the AW139 Simulator Training Center Project, which aims to meet the training requirements of Qatar Emiri Air Force AW139 Helicopter pilots, first delivery took place in June 2015. TCC was among the first product delivered to Qatar by Havelsan. It was followed by Flight and Navigation Procedures Trainer and Cabin Crew Trainer Simulator. Production and Factory Acceptance Tests (FAT) of the AW139 FMS already completed in 2015 but since the construction of the AW139 Simulator Training Center was not completed at that time it was decided to provide training service to Qatari Emiri Air Force AW139 Helicopter pilots at Havelsan facilities with the AW139 FMS. Major General Ghanim Bin Shaheen El-Ghanim, Qatar's Chief of General Staff, paid a visit to Havelsan facilities in August 2016 and performed a flight at AW139



AW 139 Full Mission Simulator

FMS. During his visit Maj. Gen. El-Ghanim also met and discuss with Qatar Emiri Air Force pilots and trainers who receive Simulator Orientation Training at Havelan facilities. 50 pilots from the Qatar Emiri Air Force were trained at Havelan facilities for a total of 600 flight hours. Havelan shipped the 47-tons AW139 FMS (manufactured with a local content rate of 70%) to Qatar on December 22, 2016. The official inauguration ceremony for the AW139 Helicopter Simulator Training Center took place on November 5, 2017.

Speaking to Anatolian Agency (AA) on April 20, 2017 the then Havelan Executive Vice President Lütfü ÖZÇAKIR confirmed that the company will open its first Middle East office in Qatar, one of its strategic partners. "We will conduct business development and project management services in the Middle Eastern countries, especially in Qatar through our office, where 15 to 20 engineers and technicians will work," he said. ÖZÇAKIR also disclosed that at least a thousand pilots will be trained at the AW139 Helicopter Simulator Training Center annually.

In February 2017 During the IDEX 2017 Fair, Havelan has signed a MoU with Taqnia Aeronautics Company of the Kingdom of Saudi Arabia (KSA) to convert AN-132D light cargo aircraft into Maritime Patrol Aircraft configuration. The ceremony was attended by SSB Prof. İsmail DEMİR.

Havelan was also selected in December 2012 by Kingdom of Saudi Arabia (KSA) for the modernization of firing ranges of the RSAF. Valued at US\$26 Million first contract covers the modernization of one firing range and scheduled to be completed in 24 months. Follow-on contract for the second firing range is expected be signed soon. Havelan has been offering its Electronic Warfare Test and Training Range (EHTES/EWT&TR) both to the Saudi Arabian and UAE Air Forces. Havelan has previously sold training service to Saudi Arabian Black Hawk Helicopter pilots.

Meteksan Defence

Meteksan Defence has the most contemporary and modern



Havelan AW 139 FMS Cockpit

solution in its field with the Damage Control Simulator developed for the requirements of the Navies throughout the world. Following a tough international competition Meteksan Defence beat out its rivals from the United Kingdom, Germany, Norway, Malaysia and India and won the tender of the Royal Navy of Oman for the delivery and establishment of a Damage Control Simulator. The contract became effective in August 2012 and after 20 months, which was ahead of the planned schedule, acceptance tests were completed, and the Damage Control Simulator was delivered in 2014. The Damage Control Simulator have delivered to the Royal Navy of Oman provides training opportunities to 24 students and includes a hangar. Within the scope of the project, that was

completed as a turnkey project, a 70% local content rate was achieved.

During the second half of 2018, Meteksan Defence secured a new contract from an undisclosed Gulf country for the delivery of a Damage Control Simulator. This is a third export contract for the Damage Control Simulator following Oman and South Korea. According to Meteksan Defence the simulator ordered by the undisclosed Gulf country basically has similar features and infrastructure with the simulator used by the Turkish Naval Forces Command, but as per end user's requests there would be some changes in the interior design considering the ships that are in the inventory of different countries. Meteksan Defence will complete the deliveries in this project in 2020.



Damage Control Simulator

Nurol Makina Sanayi

In 2013 Nurol Makina ve Sanayi (NMS) exported 20 TOMA Riot Control Vehicles (TOMA) to Libya under a contract awarded by the SSB to meet a Libyan Ministry of Interior requirement. Vehicles delivered in three batches to Libya during 2013. Under the contract NMS also provided training to the Libyan personnel who are to operate the vehicles and carry out maintenance. In August 2015 NMS delivered undisclosed number of EJDER TOMA to its first export customer, the Republic of Congo. The EJDER TOMA effectively met the operational requirements of the Republic of Congo's Law Enforcement Agency in protecting and preserving public order and was first used for ensuring security during the African Olympic Games. The EJDER TOMA, which was developed by NMS within the scope of an SSB (Presidency of Defence Industries) project that was signed in 2012, stands out as Turkey's first Riot Control Vehicle with high-level ballistic protection.

In March 2017 NMS has won first export contract for its EJDER YALÇIN 4x4 WAV. According to company, the first export contract involves a 'North African country.' The company did not name the client country for secrecy clauses in the contract. According to sources the recipient country is Tunisia and the contract covers the delivery of 70+ vehicles. Some of the EJDER YALÇIN 4x4 WAVs have been integrated with a turret armed with a 20mm automatic gun. Following the Tunisia, NMS secured contracts

from Uzbekistan, Qatar and Senegal for the delivery of EJDER YALÇIN 4x4 WAVs. According to sources NMS will deliver 1,024 vehicles to Uzbekistan ((local production), 342 vehicles to Qatar and 25 vehicles to Senegal. During DIMDEX 2018, NMS also has secured a contract to deliver 214 YÖRÜK (former name NMS) 4x4 Wheeled Light Armored Vehicles to Qatar Emiri Special Forces, to be armed with SARP RCWS, ATGM launcher and IGLA SAM launcher of Aselsan. Deliveries of the NMS 4x4 WAVs have been initiated in 2017 and scheduled to be completed in two years. On December 15, 2017, during the military parade rehearsal for the National Day of Qatar, Qatari Armed Forces have showcased latest acquisitions of combat vehicles including the EJDER YALÇIN and YÖRÜK/NMS 4x4 WAVs designed and manufactured by the Turkish Company Nurol Makina ve Sanayi. In late 2018, in the Qatari desert, Aselsan tested its new Remote-Control Weapon Station, fitted on YÖRÜK/NMS of the Qatar Emiri Special Forces.

Otokar

As the leading supplier of soft-skinned and armored 4x4 tactical vehicles to the Turkish Armed Forces (TAF), Otokar has also secured several contracts from the MENA region countries. The Middle East is the principle export market for the company, where hundreds of Otokar-built armored and tactical wheeled vehicles including 4x4 armored Internal Security Vehicles (ISV/ZIGA), 4x4 APC, COBRA-I

and 6x6 ARMA Armored Personnel Carriers (APCs) are in service with regional countries' armed and security forces. Otokar received first order for ARMA 6x6 APC in December 2010 (valued at US\$11 Million and covered the delivery of 13 ARMAs) and a follow-on contract in June 2011 (valued at US\$63 Million and covered 60 ARMAs) from Bahrain, first export customer for ARMA 6x6. According to Otokar, deployed at ground campaign in Yemen (at Marib Desert) under a joint operation of Gulf Cooperation Council (GCC) ARMA 6x6 APCs are completing their missions with great success and performance. Its performance in live a combat environment has also attracted the UAE Army. ARMA was previously short listed in UAE Army's 8x8 ACV tender covering the procurement of up to 600 vehicles, with ARMA 8x8 (other firms were Patria with the AMV and Nexter with the VBCI).

Otokar established a company 'Otokar Land Systems Limited (Otokar LS)' in the UAE with an aim to follow existing and potential export activities and to increase its exports. In September 2016 Otokar announced that a Joint Venture (JV) company would be established with Heavy Vehicles Industries, a subsidiary of Tawazun Operations Company, in order to cooperate on defence industry activities particularly at UAE and countries in the region with Tawazun. In February 2017, during the IDEX 2017 Fair Otokar signed a deal worth US\$661 Million to build 400 'Rabdan' 8x8 Amphibious Armored Combat Vehicles (based on ARMA



8x8 and fitted with BMP-3 ACV turret armed with a 100mm cannon for the United Arab Emirates (UAE) Land Forces. The 'Rabdan' 8x8 Amphibious Armored Combat Vehicles will be manufactured both at Otokar facilities in Turkey and by Al-Jasoor, a Joint Venture company between Otokar LS and Heavy Vehicles Industries of Tawazun at the Tawazun Industrial Park manufacturing facilities in Abu Dhabi. Otokar presently reached the final stage in the negotiations conducted for the second phase that covers the delivery of further 300 vehicles in various configurations. According to the contract signed in February 2017, the production of the first 100 vehicles will be accomplished at Otokar's facilities. To this end, the delivery of the first batch of 25 Rabdan vehicles, of which manufacture process was started in 2017, were delivered in November 2018. The delivery of 100 RABDAN 8x8 ACVs manufactured at Otokar facilities in Turkey is expected to be completed during the first half of 2019. According to sources the UAE Army also has a plan to order further 500 Rabdan ACVs under the third phase of the project.

Otokar also closely follows the Royal Army of Oman (RAO)'s Modern Main Battle Tank (MBT) tender covering the procurement of 77 tanks. Otokar submitted its proposal at the end of 2014 within scope of the procurement program that has been initiated in August 2013. The ALTAY MBT's PV-2 prototype participated the field tests (mobility and firing tests) executed at Oman in July – August 2018. As part of the tests, firings were executed against fixed and mobile targets with the ALTAY prototype and a 4,500km distance was covered in desert conditions. According to the information we received, ALTAY MBT displayed successful performance at the tests run in Oman. At the tender in question, ALTAY MBT's most serious competitor was the German Leopard 2A7 MBT. In compliance with the permit granted by the German Parliament, KMW previously delivered one Leopard 2A7 MBT to Oman in October 2015 for test and assessment purposes. According to the information we



High-Ranking Royal Bahraini Armed Forces Commanders were in Turkish Aerospace Facility

gathered, the summer tests as part of the project were completed and as of September 25th and the Technical Evaluation Report preparation stage was launched. Following the preparation of the report, the Oman Defence Ministry will conduct bilateral negotiations with the bidders and if deemed necessary, the companies will be requested to submit their Best and Final Offers (BAFOs) at least once. The final decision/company selection as part of the project is expected to be carried out in 2019.

Otokar also secured contracts from undisclosed Gulf countries for the delivery of Internal Security Vehicles (ISV) and URAL 4x4 WAVs.

Turkish Aerospace (TUSAŞ)

Having already completed the Falcon Star and Mid-Life Upgrade (MLU) modifications of the 17

F-16A/B Blok 15 aircraft in the inventory of the Royal Jordanian Air Force (RJAF) during 2005-2007, TUSAŞ secured a US\$65 Million (Aselsan's share is US\$24,8 Million) contract from Bahrain MoD in February 2015, for the modernization of 14 AH-1E Cobra Attack Helicopters in Royal Bahraini Air Force (RBAF) inventory by the end of 2020. Under the contract prototype helicopter underwent modernization at TUSAŞ facilities and Critical Design Review (CDR) phase has been completed in February 2016. According to sources within the scope of the project first modernized AH-1E delivered to RBAF in November 2017. Modernization/upgrade of remaining 13 AH-1E Cobra Helicopters have been planned to be performed in Bahrain with TUSAŞ' technical assistance. Meanwhile according to the



Bahraini and Turkish Pilots were in front of T129 ATAK Helicopter in Bahrain Air Show

Aselsan 2017 Activity Report, following a contract amendment issued in June 2017, the number of RBAF AH-1E Cobra helicopters to receive avionics modernization has been increased. According to open sources RBAF has procured an initial batch of eight AH-1Es and six TAH-1P trainers in early 1994 and in 1997 received another batch of 16 AH-1Es. Around 22 of these helicopters have been deployed at the 8th and 9th Helicopter Squadrons based at Rifa'a.

Within the scope of avionics modernization, the RBAF AH-1E Cobra helicopters are being upgraded with state-of-the-art glass cockpit (with colored MFDs), AselFLIR-300T FLIR, MWR and RWR systems already used on T129 ATAK helicopters. AH-1E Helicopters will also gain 70mm SAL Guided CIRIT Rocket and L-UMTaS/MIZRAK-L ATGM capability. TUSAS is also offering its T129 Mk-I ATAK helicopter for RBAF's future requirements. In this context a series of negotiations were held between RBAF and TUSAS for the T129 Mk-I.

Morocco also showed interest in the T129 Mk-I ATAK Helicopter. In June 2018 a Moroccan delegation visited TUSAS facilities in Ankara, Turkey to discuss the possible purchase of T129s. The interest in the T129 is understood to have been reinforced by reports of its impressive performance in Syria during Operation Olive Branch.

Yonca-Onuk JV Shipyard

Having completed the delivery of 34 MRTP16 Class Fast Intervention Boats (FIBs) in 2015 to the UAE's CICPA in cooperation with its local partner Abu Dhabi Ship Building (ADSB carry out the construction of 22 boats), Yonca-Onuk JV Shipyard has been awaiting to receive a contract for the second batch of 31 boats. Due to political disputes between Turkish and the UAE governments stemming from issues with the 'Muslim Brotherhood' and the military coup in 2013 in Egypt (the UAE and Turkey had a serious dispute as a result of positions they held on these issues) order for the second batch of boats did not take place so far. All of the MRTP16 boats are armed with Aselsan's STAMP (with 12.7mm M2HB) and STAMP-G (with GAU-19 gun) Remote Controlled Stabilized Naval Weapon Systems.

In July 2010 Yonca-Onuk Shipyard received a contract from Egypt for the delivery of 6 MRTP20 Class FIBs to the Egyptian Navy. Boats are armed with Aselsan built STAMP-G systems, 3 boats constructed/assembled at Yonca-Onuk facilities in Istanbul and remaining 3 boats at Alexandria Shipyard in Egypt. A production and final assembly line for the boats was established at Alexandria Shipyard. Deliveries started in 2011 and completed in 2013. Egypt had a plan to place order for further 6 MRTP20s but due to political tension occurred

between Turkish and Egyptian Governments after the military coup in July 2013 this order did not take place.

During the DIMDEX 2018 Exhibition, Yonca-Onuk has secured a contract from the Qatar Emiri Naval Forces to deliver four MRTP24/U Special Operation Crafts (SOCs) and four MRTP24/U Fast Missile Crafts (FACs). The MRTP24/U SOC's will be armed with one Aselsan's 12,7mm STAMP whereas the MRTP24/U FACs will be armed with a pair of STAMP Remote Controlled Stabilized Naval Weapon Systems as well as Aselsan's remotely-controlled BORA Low Altitude/Short Range Naval Air Defence System to be armed with MBDA's Mistral missile. At the end of 2018, MBDA successfully demonstrated the use of the Mistral missile against fast boats such as FIACs (Fast Inshore Attack Craft).

Yonca-Onuk Shipyard has previously delivered three MRTP16 Class, three MRTP34 Class (Qatar is first customer for this class) and 4 MRTP20 Class Fast Intervention Boats (FIBs, ordered in 2015 under a US\$44 Million contract) to Qatar Emiri Naval Forces. Meanwhile construction and delivery phase for the additional six MRTP 20 FIBs that were ordered during the DIMDEX 2016 Exhibition, under a €41 Million contract, is expected to be completed in 2019. The boats are armed with Aselsan's 12,7mm STAMP and 30mm STOP/MUHAFIZ Remote Controlled Stabilized Naval Weapon Systems ■





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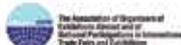
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BMC's Karasu Facilities in Sakarya was Launched with a Spectacular Groundbreaking Ceremony

One of Turkey's leading commercial and military vehicles manufacturer with over 50 years of established history, and exports to 80 countries, with vehicle production exceeding 300 thousand units since its foundation, BMC announced their future projects that will shape the next 50 years of Turkey at the 'Next 50 Years' meeting held at the groundbreaking ceremony of the Sakarya Karasu Factory on January 13, 2019

When the BMC Production and Technology Base, which will be built on an area of 2.2 million m² with an investment amounting to US\$500 million, becomes fully operational, the facility is expected to provide jobs for 10,000 people and to create US\$5 billion added value for the Turkish economy.

President Recep Tayyip ERDOĞAN, Vice President Fuat OKTAY, Minister of Interior Süleyman SOYLU, Minister of National Defence Hulusi AKAR, Minister of Industry and Technology Mustafa VARANK, Minister of Trade Ruhsar PEKCAN, Minister of Transport and Infrastructure Mehmet Cahit TURHAN, Presidential Spokesman İbrahim KALIN and President of Defence Industries Prof. Dr. İsmail DEMİR as well as high-level bureaucrats and prominent representatives of the business world attended the ceremony. During the program, the participants also witnessed the Commissioning Ceremony of the Advanced Technology Production Line at the modernized BMC İzmir Pınarbaşı Factory through a live video connection. The BMC İzmir Pınarbaşı Factory with approximately 2,700 employees was established on an area of 213,000 m² including a 100,000 m² closed area. The AMAZON Unmanned Military Land Vehicle developed by BMC and BMC TUĞRA, a high-tech truck and tractor family, was also introduced at the meeting. In addition, a 600bhp indigenous vehicle engine test was broadcasted live from the Istanbul Technical University (ITU) Test Laboratory and General



Manager of BMC Power Osman DUR shared information about the ongoing engine projects.

Accomplishing significant breakthroughs with its expertise in defence and commercial vehicles during the 5 years following privatization in 2014, BMC with 3,000 employees, today, has a diverse portfolio of various products in the fields of military armored vehicles, tactical and logistic vehicles, tanks, buses, commercial vehicles, and rail systems as well as land & air platform engines and transmissions.



President of Turkey - Recep Tayyip ERDOĞAN and BMC Executive Board Member - Yasin ÖZTÜRK

Member of BMC Executive Board Taha Yasin ÖZTÜRK: "Our annual export target in 2023 is US\$1 Billion"

Member of BMC Executive Board Taha Yasin ÖZTÜRK stated in his speech that he witnessed a historic day for Turkey and said: "With the support of our President and his great vision, we take one of the most important steps of our journey to create a national and domestic industry which has been continuing successfully for 17 years in our country. Established in 1964 and has become a valuable brand with its exports to 80 countries in addition to the products it offered to our country so far, BMC, since 2014, has had a strategic partnership between Turkey and Qatar and it continues to grow, with local and national engineering, and is on its way to becoming a world brand."

Stating that they have reached a point where they can proudly

express their activities today managing the approximately US\$1 Billion worth of investments and working capital of BMC, which was purchased by the Turkish and Qatari partnership for around US\$360 Million, in accordance with a 10-year detailed business plan, ÖZTÜRK continued as follows: “Today, we serve our nation and world countries with our 3,000 personnel and a diverse portfolio of various products in the fields of military armored vehicles, tactical and logistic vehicles, tanks, buses, commercial vehicles, and rail systems as well as land & air platform engines and transmissions. Our growing dreams no longer fit in our existing facilities. Here in Sakarya Karasu, we are breaking ground on the BMC Production and Technology Base, which will be built on an area of 2.2 million m² and reach a total area of 500,000 m² in phases, in order to build the next 50 years in accordance with the vision and targets set by our President and to serve various countries in the world, notably Turkey and Qatar with national and domestic engineering and manufacturing capabilities. When our Production and Technology base is completed by 2023, it will provide employment for approximately 10,000 people with all of its activities and will generate an annual value of US\$5 Billion for the economy of our country. Our annual export target will be around US\$1 Billion. The first phase of our facility, which will be laid today, covers about 100,000 m². It will be completed by the end of 2019 with very intensive work and will become operational at the beginning of 2020.”

ÖZTÜRK stated that Turkey's first indigenous engine is ready after 5 years of studies carried out in İzmir, BMC's new legend among trucks and trailers, TUĞRA, is on the roads to carry Turkey's heavy loads, and they are progressing on the planning of rail systems, national and domestic high-speed train and subway projects. ÖZTÜRK also shared that Turkey's indigenously designed third-generation



BMC's new generation light -class armored vehicle concept

Main Battle Tank ALTAY Serial Production Project came to life and said: “We are in the presence of our nation with a remarkable development, such as Turkey's First Indigenous Car Project.” Reminding the audience of the words of President ERDOĞAN “We need to be able to produce unmanned tanks” ÖZTÜRK stated that unmanned tank is among their goals and introduced Turkey's first unmanned land vehicle AMAZON. ÖZTÜRK thanked President ERDOĞAN as well as the participants of the meeting and completed his words by saying: “There is no rest for the weary. Working harder every day for our country and nation, we will continue to carry this national flag with pride, honor and success, thanks to your support.

Minister of National Defence Hulusi AKAR: “The Rate of Localization which was 20% in 2002 Reached 68% Today”

In his speech at the ceremony, Minister of National Defence Hulusi AKAR underlined that



Hulusi AKAR - Minister of National Defence

localization and nationalization are no longer a choice for our country, but an indispensable necessity for our survival. Minister AKAR: “Turkey, to survive in this region, is bound to be deterrent, powerful and successful with its own weapons. Just as geography is fate, Turkey is also the fate of this geography. Since we could not produce our main battle tanks and artillery systems with national resources, we waited for years to buy from abroad. Therefore, we have started to take measures with our own means today. We will accomplish weapons and equipment projects for modern warfare without depending on the technologies of foreign companies. We continue to work intensively on the steady road to localization and nationalization.”

Minister AKAR made the following comments in the last part of his speech: “The increase of the localization and nationalization rate, which was 20% in 2002, to 68% today clearly indicates the success of our studies. Our primary goal in this respect is to develop advanced technologies with our own possibilities and capabilities. It is imperative and necessary to increase the effective and efficient use of country resources in order to meet the needs of the Turkish Armed Forces in a timely manner. The management of the 1st Main Maintenance Center in Arifiye should be evaluated within this scope. Current investments and such investments to be made in the region will also contribute significantly to employment.”

Minister of Industry and Technology Mustafa VARANK: "700 Domestic Patent Applications were made in the Sector in 16 Years"

Minister of Industry and Technology Mustafa VARANK stated at the BMC Production and Technology Base produce value-added products with domestic and national capabilities, from commercial vehicles to ALTAY tanks, from engines to rail systems. VARANK stated that when these products enter the world market, they will provide a significant contribution to Turkey's prestige in terms of production quality. "These things require very serious vision and dedication. We can clearly see how the vision and economic policies of our President contributed to our country for 16 years. Our current R&D ecosystem became a reality thanks to our production capabilities and goal & solution-oriented approach to the economy.

Underlining that 700 domestic patent applications were made in the Sector in 16 Years, 63% of which were applied for in the last 5 years, VARANK stated that all of their efforts are shaped by the "Fully Independent Turkish Defence Industry" vision of the President Recep Tayyip ERDOĞAN. VARANK emphasized, "Our goal is not to become subcontractors to the international defence industry producers, but to make our domestic and national defence industry a global brand." and said: "We follow each stage studiously from strategy to design, infrastructure establishment to technology development, and prototype to commercialization. We use every means available for the projects that will bring technological superiority to our country and bring production and test infrastructures to our country. I was in Eskişehir 10 days ago. We attended the inauguration ceremony at TEI for the Test Cells of the T700 turboshaft engines to be used on the Turkish Black Hawk (T70) helicopters. Hence, T700 turboshaft engines with a localization rate above 60% can



Mustafa VARANK - Minister of Industry and Technology

be produced and exported, and it will be possible to carry out the production tests of these engines in our country. Also, in Eskişehir, we conducted the test of TS1400, the first national helicopter engine designed by our own engineers which will power the GÖKBAY helicopter named by our President. Mentioning the investor-friendly Industrial Zones Law, VARANK noted that the area where the foundation is laid is declared as the Karasu Individual Investment site on behalf of BMC and made the following statements: "We provided project-based incentives to this integrated facility for the production of rail systems, armored vehicles, various road vehicles, defence industry systems, diesel engines, and sub-components. When this production and technology base is completed, it will provide new jobs to approximately 10,000 citizens. In addition to the domestic added value to be produced, the exports to be made here is expected to reach US\$1 Billion per year. Our support for the company is not only limited to the investment site and incentives. We cannot consider value-added production separate from R&D. The BMC R&D Center, which employs 269 engineers, also benefits from the support of our Ministry. In addition, the company carries out 25 projects in cooperation with TÜBİTAK. Our support in R&D, investment

and production processes and our cooperation in joint projects, are undoubtedly making great contributions to BMC. Therefore, strong companies such as BMC bring a serious dynamism to both the sector and the national economy."

President Recep Tayyip ERDOĞAN, in his speech at the BMC Production and Technology Base Groundbreaking Ceremony, congratulated everyone who pioneered for the realization of this project and reminding the Turkish-Qatari partnership in the project, offered his gratitude to Emir of Qatar Sheikh TAMİM. President ERDOĞAN said: "From the July 15 coup attempt to the attacks on our economy in August, we have never forgotten, nor we will ever forget the solidarity of our Qatari brothers showed to our country. Just as Turkey showed solidarity with Qatar against the siege attempts of certain powers, Qatar also proved itself as a true friend in all critical situations faced by our country. Expressing his wishes to continue the strengthening of Turkish-Qatari partnership in the future in various fields such as the defence industry, trade, tourism, and energy, ERDOĞAN continued his speech as follows: "Turkey, as a monument for peace, tranquility, and stability in a region of strategic importance, is a source of trust not only for our 82 million people but for all the friendly and brotherly communities. Throughout history,



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these lands have been a safe haven for those who suffered and were subjected to oppression and persecution because of their religion, language, belief, and ethnic identity.”

Stressing that Turkey does not have the luxury to push the defence industry into the background and Turkey should become powerful with its military capacity, and economic, political and diplomatic capability, ERDOĞAN emphasized “We increased the rate of nationality in our defence industry to 68% from 20%, however, we are not satisfied with it and we are carrying out studies to increase this rate even more.” Indicating that Turkey suffered the consequences of foreign dependency in weapons, ammunition, and military equipment notably in the 1974 Cyprus Peace Operation, ERDOĞAN continued: “Our strategic partners left us in the lurch. Communication is vital in the battlefield. Our strategic partners silenced our radios, our communications systems collapsed. But now we are free of them, we are now producing our own radios. We don’t need them.”

President ERDOĞAN stated, “Our deterrence, particularly in the field of the defence industry, must be very high.” and made the following assessments in his speech: “Turkey, in all critical areas, especially in the defence industry, should not only become self-sufficient but also reach a level that can meet the needs of its friends. As a matter of fact, thanks to the steps we took, we managed to reduce our foreign dependency ratio to 35% which was 80% in 2002.”

Pointing out that Turkish Defence Industry companies exported armored vehicles, air defence systems, rocket systems, simulators, coast guard ships, communication, command control systems, and software, ERDOĞAN also noted that success is the result of the combination of public opportunities and the private sector’s experience and dynamism.



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President ERDOĞAN stated that a US\$1.5 Billion agreement was signed for the export of MilGem Corvettes to Pakistan, and an agreement was reached with Ukraine on the sale of six UAVs and added that none of the developed countries produce one hundred percent of the products, supply different parts from many various countries and certain parts of the F-35 aircraft was sent from Turkey.

ERDOĞAN provided explanations about the work in the 1st Main Maintenance Center in Sakarya and pointed out the fact that they will make a new investment worth of US\$40 Million to the facility and emphasized that their decision was intended to increase the efficiency, productivity, and technology of the factory. ERDOĞAN said:

“Because the property of all the activities to be carried out there, all the facilities on the factory site and all kinds of equipment used in production, maintenance, and repair, belongs to the state and will remain so.”

President ERDOĞAN stressed that the decision about the factory in Arifiye is not “privatization” but rather the transfer of management rights to BMC within certain conditions, periods, and restrictions.

Following the speeches, the first concrete mixture was poured for the foundation of the BMC Production and Technology Base by President ERDOĞAN and members of the protocol participating in the ceremony by pressing together the remote-control buttons of the concrete mixer ■



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One of the major contributors to the increasing success of Turkish defence and aerospace industry is not only the support of major platform and system producers but also the indigenous solutions created by companies such as CES Advanced Composites (CES).

CES is an advanced composite component provider operating in the field of aviation, defense and ballistic solutions. It designs and produces innovative and reliable components for defence and aviation industry, as well as providing light-weight armor and survivability solutions for vehicle and personal protection. CES has been undertaking projects that have redefined the standards of the industry and is now gearing up to further extend its reach to satisfy the requirements of international companies from friendly and allied nations, along with domestic clients. At IDEX, CES is showcasing its ballistic products personal and vehicle

products to users from around the globe.

Açık Group's Venture into Defence & Aerospace with CES

CES operates as a subsidiary of its parent company, Açık Group. The parent company itself has been changing the dynamics of the industries it operates in, with its innovative mind set and forward-looking enterprises. Açık Group operates a total of 14 different companies under five different company brands, employs more than 1000 employees and has a turnover in excess of TL 1 billion. Operating in various sectors such as telecommunications, air conditioning, data center system integration, cybersecurity, aviation and defence, Açık Group is a trusted provider of its global users, with its utilization of latest technologies serviced from its local companies in Azerbaijan, Saudi Arabia, Kazakhstan, United Kingdom, Vietnam and Germany as well as Turkey.

Among Açık Group's primary ambitions is to strengthen its position among the prominent

companies in the global scene, through CES's production of high-technology and high-standard products in the defence and aerospace sector.

Thrusted Solution Partner in Ballistic Protection

From a modern facility established in an area of nearly 20,000 square meters, CES Advanced Composites provides its business partners with a wide spectrum of services, ranging from conventional methods to highest standard production techniques that meets the international aviation industry standards. Through its recent major investments, CES has now the largest production and R&D capacity in Turkey, that enables the company to fulfil its wide production portfolio in both advanced composite and advanced armor areas.

CES develops solutions while paying close attention to the needs of today's global markets and has been manufacturing personal ballistic protection equipment according to the highest world standards. With its experienced



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engineering staff, the company designs and produces products that offer protection against the various threat levels. In the design of its personal protective equipment, such as helmets, vests, inserts and shields, CES focuses on providing advantage and ease of use to the end user out in the field, in terms of ergonomic design, optimum weight and easy accessory integration. CES is also advancing with its innovative solutions in spall liner and add-on armor for land, air and naval platforms, which is an area witnessing significant investments in Turkey. CES has become the #1 composite ballistic solution provider in Turkey with its indigenous and innovative solutions and large production capacity. CES's products are today being used on various land, naval and air platforms in Turkey and abroad.



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CES Ballistic Helmet

As a part of its global endeavors, CES Advanced Composite & Defence Technologies Inc. joined the FLASH (Flexible Light Armaments System for Helicopters) project by collaborating with Paramount Group, one of South African global aviation & defence companies. CES is assigned to design and manufacture the cabin floor armor of Airbus H125M helicopter.

CES is the only company in Turkey which develops modular ballistic floor panels, armored wing panels and pilot seat armor for air platforms. With its engineering power and high capacity, CES has become the biggest supplier for land vehicle platforms for add-on armor solutions spall liners in Turkey.

Production in World Standards

Having been certified to AS9100 standard for the last five years – international standard for the aviation industry – CES Advanced Composites is today a reliable solution partner for global companies such as Airbus, Leonardo and Sikorsky.

The company is the proud owner of the highest capacity advanced composite manufacturing facility in Turkey and has a National and NATO Facility Security Clearance Certification.

CES utilizes its expertise in aviation and high-quality standards both in composite and armor segments in every manufacturing process.

Target for 2020: Global Success

In terms of its goals for 2020, CES Advanced Composites is aiming to be delivering 50 per cent of its products to global customers and becoming one of the world's leading companies in the field of advanced composites and ballistic protection. Allocating a significant percentage of its turnover to R&D, the company has been declared as an R&D center by the Turkish Ministry of Economy. R&D efforts in 2018 were awarded by Ankara Chamber of Industry at the 55th Year Award Ceremony in 8



February 2019.

CES Advanced Composites is in the process of renewing hundreds of metal parts with high technology composites as contracted by major Turkish land vehicle manufacturers such as FNSS, Otokar and BMC, and is expanding its R&D team accordingly.

CES will continue to advance its capabilities, enhance its technological infrastructure and achieve its targets in R&D in the coming years. CES will be taking part in numerous global defence and aerospace sector exhibitions in 2019.



CES Advanced Composites will manufacture the cabin floor armor of the H125M helicopter of Airbus

MoND: The First Step Taken for SIPER – the National Long-Range Air Defence and Missile System Project



The Department of Public Relations of the Ministry of National Defence (MoND) organized an information meeting regarding events that have occurred in 2018 as well as those that have transpired since the beginning of this year.

In the meeting held at the Ministry, Lt. Commander Nadide Şebnem AKTOP stated regarding air defence systems, “The air defence system is not a choice but a necessity for our country, which is exposed to significant air and missile threats. With the procurement of S-400 systems from the Russian Federation, our country will be acquiring an important air defence capability. Our efforts which we initiated in order to develop our own national systems through technology transfer and joint production are being carried out by our allies EUROSAM, which is a partnership between Italy and France. In regard to the Patriots, the negotiations within the scope of the proposal submitted by the United States still continue by the Presidency of Defence Industries.”

Lt. Commander AKTOP also stated that they have taken the first step in the indigenous and national long-range air and missile defence system project dubbed as SIPER.

Enhanced Long Range Area Air and Missile Defence System

[GUMS] Project was launched in 2016 by the SSB to meet the Turkish Air Force [TurAF]’s long range air and missile defence requirement via locally designed and manufactured, indigenous solutions. Aselsan has been tasked as Prime Contractor to cooperate with Roketsan and TÜBİTAK SAGE, main local subcontractors. The indigenous Enhanced Long-Range Area Air and Missile Defence System to be developed under the GUMS Project is dubbed the SIPER/HİSAR-U, which will be an original system with state-of-the-art military capability designed to counter the most challenging threats and slated to reach fruition in the mid-2020s. According to sources HİSAR-U will be equipped with Ka-Band RF seeker and would be able to intercept incoming ballistic missiles at 30 km and over altitudes with hit-to-kill concept/capability.

According to the Turkish MoND the SIPER/HİSAR-U long-range air defence missiles can only be used against air breathing targets including fighter jets, UAVs and cruise missiles and will have an effective range of 70-90km.

Relaying information also on the delivery process of F-35 aircraft and on the training of instructor pilots, Lt. Commander AKTOP said, “We received the delivery of the first two F-35 aircraft on June 21, 2018. Instructor pilot and maintenance staff training continues in the US. A total of 4 aircraft, with 2 aircraft to be delivered in March 2019 will remain in the US until the end of 2020 for instructor pilots / maintenances training. The 5th and 6th aircraft will be delivered to Malatya on November 30, 2019.”

National F-35 Integrated Training Center (ITC) will be Operational in 2020

Within scope of the F-35 procurement program, the first Turkish F-35 aircraft with the tail number of 18-0001 on June 21, the

second aircraft with flight number of 18-0002 was delivered to the Turkish Air Force on June 22, 2018. The first two delivered aircraft are planned to stay in the United States until end of the year 2020, and then to be deployed to the air training base of the 172th fleet in Malatya, which is currently under construction and will be fully operational in the last quarter of 2019 following accreditation processes.

As the first main Operating Base of the TurAF F-35As, in addition to the 172nd and 171st Squadrons, the 7th MJB will host the National F-35 Integrated Training Center (ITC), where TurAF pilots and maintainers will perform training. The F-35 Integrated Training Center to be constructed in Malatya will be similar to Luke Air Base in Arizona, United States. New buildings/facilities are under construction at the 7th MJB to accommodate the F-35A aircraft include; new Hardened Aircraft Shelters (HASs) and hangars, underground pens, Squadron and Headquarter buildings, mess halls, guest houses, maintenance facilities, depots, heating plant, sport facilities, taxi ways, concrete pavements and a National F-35 ITC building. The training of Turkish Air Forces pilots and maintainers as well as pilot and maintainers training of F-35 user countries especially in Europe are planned to be conducted at this facility.

The third (AT-3) and fourth (AT-4) F-35A aircraft of the Turkish Air Forces, which are under production phase at Lockheed Martin facilities, are scheduled to be delivered to the Turkish authorities in March 2019. It is stated that the third and fourth aircraft will also stay at Luke Air base in Arizona by the end of the year 2020. The fifth and sixth aircraft, which are planned to be delivered in November 2019, are expected to be deployed to the air training base of the 172th fleet in Malatya immediately after the delivery ceremony.



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An Overview of Turkish Defense Industry News, January - February 2019

Deliveries of the First Orders of ANKA-S Completed Successfully

Delivering two more air vehicles as part of the ANKA-S Project on 8-10 January 2019, TUSAŞ completed the order covering the delivery of 10 ANKA-S UAVs. The latest delivery regarding the Project was made in September 2018 and the number of ANKA-S UAVs under the inventory of the Air Forces reached 8 with two more air vehicles delivered. 2 ANKA-S fleets were added to the Air Forces Command with this Project. All spare parts and supporting ground vehicles were also delivered for the systems which are being operated at two different bases. All maintenance operations of the air vehicles will be conducted by the Air Forces Command (HvKK).

In the meantime, the ANKA-S UAVs delivered to the HvKK performed their first armed assignments again in January. President of Defense Industries Prof. İsmail Demir shared the following statement from his social media account on 20 January 2019, "The ANKA-S UAVs we delivered last week to the HvKK successfully accomplished their first armed assignments". The first firing test with the Armed ANKA-S UAV was successfully conducted in August 2018. During the test, Roketsan's MAM-L Smart Micro Munition was fired from the ANKA-S UAV with the tail number 17-023.

On 25 October 2013, TUSAŞ was awarded a US\$ 290 Million contract by the SSB to deliver 3 ANKA-S systems with 10 aircraft (2+4+4), 12 ground control stations and sufficient radar-based automatic take-off and landing systems to allow deployment to two separate air bases to meet the TurAF's requirements. Aselsan's share of the contract, delivering 10 CATS FLIR payloads and some avionics including INS/GPS and radio systems is valued at US\$ 33.6 Million. The ANKA-S Project covers the manufacture of a total of 11 ANKA-S UAVs, 10 of them for the TurAF and the 11th one for the TUSAŞ as a test bed.

According to an image published on the SSB's social media account, the last two ANKA-S UAVs (9th and 10th air vehicles) are equipped with CMX-15D FLIR payloads rather than Aselsan's CATS FLIR. The ANKA-S with tail number 18-030, either 9th or 10th ANKA-S platform, is shown with CMX-15D FLIR payload. On 25 September 2018, through his social media account, President of Defence Industries Prof. İsmail DEMİR shared with the public opinion that the CATS FLIR System developed by Aselsan was accepted over TUSAŞ' ANKA-S UAV. In the image shared at that date by the SSB President DEMİR, the CATS FLIR payload



could be seen over the ANKA-S with the tail number 17-015 (this air vehicle is one of the two air vehicles delivered on 8 April 2018 [the other one is the air vehicle with the tail number 16-016] and it was equipped with the StarSAFIRE-380-HLD FLIR payload during its delivery). The first six ANKA-S UAVs delivered to the HvKK were equipped with the StarSAFIRE 380-HLD FLIR payload. The type of the FLIR System of the 7th and 8th ANKA-S air vehicles is unknown. The CMX-15D FLIR payload was previously spotted on the ANKA-S UAV with the tail number 18-031. CMX-15D is still being utilized at the BAYRAKTAR-TB2-S Armed UAVs as well.

In line with the decree adopted at the Defense Industry Executive Committee (SSIK) meeting on 11 October 2018, TUSAŞ received a new order of a total of 22 ANKA UAVs composed of 16 ANKA-S and 6 ANKA-Bs for the utilization of the security forces under the coordination of the Presidency of Defense Industries (SSB). The



delivery of the Ground Control Stations, the SARPER SAR/GMTI radar and CATS FLIR payloads will be accomplished with these systems as well. The ANKA Block-A, Block-B and Block-S UAVs under the service of the security forces completed a total of 15,000 hours of flight as of 10 January 2019.

Ukraine Became the Second Export Customer of BAYRAKTAR TB2-S AUAV

President of Ukraine, Petro POROSHENKO announced the signing of the contract with Turkey on the procurement of BAYRAKTAR TB2 type Unmanned Air Vehicle on 12 January 2019. Ukraine's President POROSHENKO declared through his social media account that they previously reached an agreement with Turkish President Recep Tayyip ERDOĞAN on the procurement of the UAVs and added, "A contract for the procurement of Turkish BAYRAKTAR TB2 UAVs to the Ukrainian Army was signed in line with our agreement with President ERDOĞAN". POROSHENKO underlined that the contract between the Ukrspetseksport under the defense industry company UkrOboronProm and Bayrak Makina was a critical part of the efforts for expanding the technical military cooperation between Ukraine and Turkey and noted that Ukraine's strategic approach was fully compatible with NATO's.

In the news by Russian and Ukraine press in November 2018, it was claimed that an agreement was reached, and signatures were put on the contract on Ukraine's procurement of BAYRAKTAR TB2-S AUAV from Turkey. On the other hand, as part of his two-day visit to Turkey in the beginning of November 2018, POROSHENKO visited Baykar Makina's Unmanned Air Vehicles Systems Factory with the accompanying delegation and military and other types of UAV solutions were presented to the delegation within the scope of this visit.

It was announced that Ukraine



will be paying US\$ 69 million to Turkey for 6 BAYRAKTAR TB2-S AUAV (a total of three systems, each composed of two UAVs), 3 Ground Control Stations and 200 Smart Munitions. Ukrainian sources noted that technical maintenance and staff training were also included in the contract. The delivery of three BAYRAKTAR TB2-S AUAV Systems to Ukraine is expected to be completed within 2019.

SSB President Prof. DEMİR stated via his social media account on this export's success on 13 January 2019 and said, "The export of the first indigenous UAV/AUAV platform BAYRAKTAR TB2 entered in the Turkish Armed Forces to Ukraine is a crucial accomplishment for our Defense Industry. I would like to congratulate Baykar Company and all those who have contributed."

During the DIMDEX 2018 Fair held on March 12-14, 2018, it was revealed that Baykar Makina secured a contract for the delivery of three BAYRAKTAR TB2-S Armed UAV Systems with six aircraft, FLIR payloads, three Ground Control Stations and a UAV Training Simulator to Qatar Emiri Air Forces Reconnaissance and Surveillance Centre Command, within one-year schedule. BAYRAKTAR TB2-S Armed UAVs will carry Roketsan's MAM-L and MAM-C smart munitions. Under the contract Baykar Makina will also set up a UAV Operation Center and network-based data tracing and archiving software for the Qatar Emiri Air Forces. Baykar Makina will provide UAV Pilot, Payload (probably CMX-

15D) and Maintenance training to Qatar Emiri Air Forces personnel, who will fly BAYRAKTAR TB2-S Armed UAVs, in Turkey. Baykar Makina will provide 2-year logistics support to Qatar Emiri Air Forces for the operation of BAYRAKTAR TB2-S Armed UAVs.

Contract Signed with Aselsan on Serial Production of OMTAS Missiles' IIR Seekers

In the statement made by Aselsan on 10 January 2019 to the Public Disclosure Platform, Aselsan announced that a contract worth TL 63 million + EUR 31.5 million with Roketsan was signed regarding the serial production of the IIR Seeker Head of OMTAS Missiles on 10 January 2019. Deliveries within the scope of the contract will take place in 2019-2024.

The OMTAS/MIZRAK-O Anti-Tank Guided Missile (ATGM), which is expected to be included in the Turkish Land Forces Command inventory within 2019, is designed to be fired on a tripod or on a land vehicle. Top-attack or direct attack mods and fire-forget or fire-update attack mods of the 160 mm caliber OMTAS, which can be fired from a closed area without harming the gunner, can be selected on the launching system by the gunner prior to the firing. Featuring an uncooled Imaging Infrared seeker head, a two-way radio frequency data link and a tandem warhead that is effective against reactive armors as well, the OMTAS ATGM will be able to be used against a minimum range of 200 m and maximum 4 km.

Roketsan launched the serial production of OMTAS ATGMs during the second half of 2018. Within the scope of the Weapon Carrier/Anti-Tank Vehicle (WCV) Program, of which contract became effective on 14 October 2017, FNSS will deliver a total of 260 wheeled (76 x PARS 4x4) and tracked (184 KAPLAN-10) type anti-tank vehicles to be integrated with Remotely Operated Anti-Tank Turret. 80 KAPLAN-10 WCVs will be equipped with Kornet-E ATGMs and the remaining 104 will be equipped with Roketsan's MIZRAK-O/OMTAS ATGMs. All of the 76 PARS 4x4 WCVs will be equipped with Roketsan's MIZRAK-O/OMTAS ATGMs.

Signing Ceremony of the SSB's R&D Projects

Within the scope of Turkey's Vision for the year 2023 and in line with the 3% R&D target in the defense industry, signatures were placed for 14 new R&D projects on January 26 as part of the "SSB's R&D Panels" launched by the Presidency of Defense Industries. In the statement made by the SSB, it was announced that signatures were given for 14 new projects with 11 universities and 3 TÜBİTAK institutes, as either contractors or subcontractors. The projects for which the R&D activities will be made according to the contracts signed are as follows: Development of the SDN and NFV Based 5G Core Network (ÇINAR), Social Media Anomaly Detection, Incident Tracking and Analysis (HAVADİS), Deep Learning Big Data Analysis Platform (Değirmen), Multi - Dimensional Wireless Communication Sign Analysis Platform (KAŞIF), Source Management Algorithms in Cognitive Radio Networks and Test Simulator Development (KAYA), Interference Management at Cognitive Radio Networks (HİZA), Development of New Generation Material for Domes and Optical Windows (KUBBE), Development of Nickel Metal Powder suitable for Additive Manufacturing for Aerospace Applications (ATOM), Development of the Refractor



Materials for Missile Jet Wing Applications (REFRAKTER), Project on the Development of Titanium Laminated Manufacturing Process with the Method of Electron Beam Melting (ELEKTRON), Development of Aviation Quality Stainless Steel and Nickel Based Super Alloys (DİNÇ), Development of GAN Based G/A Module Components (AKASYA), Project on the Development of GAN Based High Performance Integrated Circuits operating at Millimeter Wave Band (MOGAN) and Development of Powder Thermobaric Bombs (VOLKAN). As a result of these projects and signed contracts, the aim is the transferring of R&D projects to industry, acquiring the technologic components required within the scope of the sub systems of platforms and main system projects such as military type radios, public security broad band communication network, and intelligence systems. In

accordance with the R&D panels launched by the Presidency of Defense Industries, a total of 22 projects commenced in the period between 2017- 2018.

Minister of National Defense Hulusi AKAR's visited TEI

Minister of National Defense Hulusi AKAR, Chief of the General Staff Full General Yaşar GÜLER, Commander of the Air Forces General Hasan KÜÇÜKAKYÜZ, Deputy Minister of National Defense Muhsin DERE and the accompanying delegation visited TEI's premises in Eskişehir. The visit starting with an informative meeting with TEI President and CEO Prof. Mahmut F. AKŞİT and continued with a tour at the facilities. The delegation initially observed tests of the PD170 turbodiesel aviation engine powering the ANKA and the PD222 which is an upper version of the PD170. Then they followed





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the test of the TS1400 Turboshaft Engine which will be powering the GÖKBAY Light Class Utility Helicopter.

Electronic Support Measure System Factory Acceptance Tests of the 4th MILGEM Vessel TCG "Kınalıada" Fulfilled

According to the news published in the February monthly e-bulletin by Aselsan, the factory acceptance tests of the ARES-2N Electronic Support System manufactured for MILGEM's fourth vessel TCG "Kınalıada" were completed successfully. During the tests, the ARES-2N Electronic Support System successfully passed numerous performance and function control tests. In the next stage of the project, port and sea acceptance tests are aimed to be accomplished within 2019 after the integration of the system to the vessel platform.

Providing solutions specific to the naval platform at 2-18 GHz operating frequency, the ARES-2N Electronic Support System features the capabilities of detecting, intercepting, identifying, classifying, tracking/monitoring, direction finding, localizing, audio warning, platform correlating and recording the electromagnetic emissions. While the ED System enables the broad band identification of the radar signals, Single DF in wide frequency band and high sign processing features allow the detection and identification of complex radar signals. The system with the precise parameter measurement and advanced emitter characterization capabilities is also capable of monitoring the detected broadcasts and identify their locations.

SSB Delegation Led by the President of Defense Industries Prof. İsmail DEMİR Visited TÜBİTAK - SAGE

President of Defense Industries Prof. İsmail DEMİR and the accompanying Vice Presidents of Defense Industries Prof. Faruk YİĞİT, Celal Sami



TÜFEKÇİ and Harun ÇELİK visited TÜBİTAK SAGE on 21 January and received information from officials on the latest status of the projects executed by TÜBİTAK SAGE. Following the project presentations, the SSB delegation led by Prof. İsmail DEMİR examined Turkey's first indigenous Air to Air Missile System GÖKTUĞ which being developed by TÜBİTAK - SAGE and currently under the test phase.

ALKAR Depart for the Duty Station

The ALKAR 120 mm Mortar System integrated to BMC VURAN vehicle was dispatch to its duty station lby the team that developed and manufactured it. According to the news in the February issue of Aselsan's e-bulletin, ALKAR's user training was completed and the system directly hit its targets for the

ballistic demonstration performed by the user staff in a way aligning with its name (in old Turkish ALKAR means "exterminator, destroyer"). Gaining the admiration of the delegation watching the ballistic training, the ALKAR 120 mm Mortar System's final controls were completed and the system arrived its duty station. Developed indigenously by Aselsan, the ALKAR 120 mm Mortar System is the first indigenous automatic mortar system. ALKAR System is capable of being integrated to many vehicles of various types including 4x4 vehicles and to fixed plants. Heavy demand from our country and foreign countries is expected soon for the serial production of the ALKAR System.

AHS-120 Aselsan 120 mm Mortar System, originally designed entirely by Aselsan including sub-systems, is a modern weapon system integrated on a



ALKAR 120mm Mortar System was fired on BMC's VURAN Vehicle

turret equipped with Automatic Barrel Lying System, Automatic Ammunition Loading System, Recoil Mechanism and Fire Control Systems.

Considering today's increasing demand for automation of mortar systems, AHS-120, like other Aselsan's weapon systems, is predicted to have a significant share in both domestic and foreign markets. Due to the modular system architecture, system can be integrated to tracked or tactical wheeled platforms as well as stationary platforms. At the same time, modular system architecture enables the integration of any kind of domestic / foreign rifled or smoothbore mortar barrel.

Recoil Mechanism, originally developed by Aselsan engineers, reduces the force transferred to the platform during shooting. This feature increases the variety and number of platforms with which the system can be integrated.

Automatic Ammunition Loading System, originally developed for AHS-120, provides precise, fast and safe loading of ammunition.

Advanced Fire Control System Technology, Automatic Barrel Lying, Automatic Ammunition Loading and Muzzle Velocity Management features enables performing the fire mission in the shortest time, achieving desired effect on the target most effectively with a minimum amount of ammunition and quick deployment.

The precise position and orientation information is provided by the Inertial Navigation System and the system is deployed in a very short time and ready for shooting. While the vehicle is moving, to show the position and directional information provided by the Inertial Navigation System located in AHS-120 on the Driver and Shooter Display Units allows the driver to follow the planned route.

While providing a mission-oriented, menu driven colored graphical user interface, the system provides a display of battlefield information on a digital map.



The Signing Ceremony of BORA Missile System Logistical Project

Ballistic BORA Missile System Logistical Support Project Inked

The BORA Missile System Logistical Support Project, which will be fulfilling the requirement of keeping the BORA missile systems on active duty with all its functions, was signed between the SSB and Roketsan on 26 January 2019.

President of Defense Industries Prof. İsmail DEMİR and representatives from the Ministry of National Defense, General Staff, Land Forces Command and Roketsan participated in the signing ceremony held at the Presidency of Defense Industries. On account of this Project, the demand for maintaining the BORA missile systems under the inventory of the Land Forces Command, actively in duty with all its functions will be fulfilled.

The BORA Missile is recognized as Turkey's first indigenous and long-range missile and has a range of 280 km and a warhead of 470 kg. The BORA Missile was debut at Roketsan's booth in IDEF 2017 and then Minister of National Defense Fikri IŞIK shared with the public opinion in May 2017 that the last firing prior to the delivery to the Turkish Armed Forces was accomplished and the first delivery was completed. Different figures were declared by the press regarding the systems to be delivered. As part of the second 100-day action plan shared with public by President Recep Tayyip ERDOĞAN on 13 December 2018, it was announced that the last lot to be procured would be delivered as part of the BORA Weapon System and the BORA Missile Project.

Aselsan Delivered the 500th Anti-UAV IHASAVAR System

Drones/Mini UAVs are increasingly becoming a critical threat with each passing day in operational fields especially due to their easy access and are being utilized more by terrorist groups. With the advantages such as their accessibility, which does not require very much training, the practical execution of the modification implementations, these mini platforms have turned out to be severe threats to mobile military units, military and critical facilities from the air dropped explosive attacks.

Requirements were identified for enabling protection against the utilization of Drones/Mini UAVs for terrorism purposes and as a result of the R&D activities launched by Aselsan in 2017, the Anti-drone that could be easily installed and carried by individuals was first launched at the High-Tech Port event in 2016. Following this first prototype demonstration, consequently demands and orders were received from security



forces, and the first deliveries of the system were accomplished in November 2017. The February issue of the Aselsan Bulletin announced that the delivery of the 500th System was accomplished within the scope of the various contracts signed with domestic and foreign customers.

The Anti-UAV RF Jamming/Spoofing system is capable of neutralizing all threats that may be generated through drones/mini UAVs by simultaneously jamming the remote command, GPS/ GLONASS satellite navigation, data and image transfer frequencies. The Anti-Drone RF Jamming/Spoofing system developed is composed of a backpack. This backpack containing a Jammer, a Battery and a control unit additionally has a directed antenna in the form of a 2kg. The user detecting the target through the binoculars over the directed antenna system could direct the RF signals generated by the jammer at a width of 60 degrees, extending wider as it gets further away. Through this broadcast, the signals between the GPS satellites and the user are terminated and thus the drone is neutralized. With the help of this system capable of jamming Remote Command and Data Link frequencies, the drone's capacity of simultaneous image capturing, and data transfer is also prevented.

The system is capable of non-stop broadcasting for a minimum of 1.5 hours with rechargeable, high capacity Li-Ion batteries.

Preveze Class Submarines are to be Modernized

The Preveze Class Submarine Half-Life Modernization Contract was signed between the Presidency of Defense Industries and STM-Aselsan-Havelsan-ASFAT Joint Venture.

In the signing ceremony held at the premises of the SSB, the President of the Defense Industries Prof. İsmail DEMİR, representatives of General Staff, Naval Forces Commanders and the companies who will take part in the project participated.



© Turkish Naval Forces

TCG Preveze S-353

Within the scope of the project, the existing systems of four Preveze class submarines in the inventory of the Naval Forces Command will be renewed and the submarines will gain new capabilities for naval operations. The four submarines to be modernized are expected to be operational in 2023, 2024, 2026 and 2027, respectively.

SPEWS-II Electronic Warfare Self-Protection System Have Started to be Used in F-16 Block-50 Aircraft

It was announced from the official twitter account of the Presidency of Defense Industries on February 7, 2019 that the tests

regarding the SPEWS-II Electronic Warfare Self-Protection System, which was developed jointly by Aselsan and BAE Systems and 60 units (53 mass production and 7 pilot systems) are to be supplied in order to protect the Turkish F-16 C Block-50 Aircraft from missile threats, were completed successfully. In addition, 21 SPEWS-II systems out of a total of 60 were integrated into the aircraft and have started to be used.

The system, consisting of radar warning receiver and RF jammer, operates in compatible manner with other avionics and countermeasure dispensing systems on the platform and performs detection, identification, deceptive RF jamming and deception of hostile radars ■



Otokar Exports Surged in 2018

Otokar General Manager Serdar GÖRGÜÇ: "We are proceeding towards our goal of becoming a global brand with brave steps"

Otokar, one of the Koç Group companies, announced its 2018 financial results. Stating that it was overall a more challenging year compared to 2016 and 2017, Otokar General Manager Serdar GÖRGÜÇ said, "We concluded 2018 with turnover of TL 1,679 million. Proceeding on a clear path with courageous steps towards the target of becoming a global player, Otokar was able to double its export in 2018, compared to the previous year. Our profits reached the level of TL 164 million which is a 65 percent an increase".

Turkey's leading automotive and defense industry company Otokar, operating in over 60 countries in five continents with the intellectual property rights owned by the company, shared 2018 financial results. Noting that despite the recession in the domestic market in areas where Otokar is active, Otokar continued to perform its activities in 2018 with the target of becoming a global brand, General Manager Serdar GÖRGÜÇ added, "The recession in the segments in which we are active in the country in the last three years continued in 2018 as well. The fluctuations in the financial markets this year and the cash shortage emerging in the aftermath affected the domestic market adversely. As a result of these developments, Otokar concluded the previous year with a turnover of TL 1,679 million, with a decrease of 6 percent. However, with the help of the plans we made through foreseeing the aforesaid developments and on account of the measures we adopted, we achieved our targets in 2018, and raised our net profit to the level of TL 164 million with an increase of 65 percent".

Underlining that Otokar, focusing on exports in 2018 as a result of the ambiguity and shrinkage in the domestic

market, achieved fruitful results both in commercial and military areas, GÖRGÜÇ continued, "We focused more on exports in 2018. We increased our exports by 99 percent with the help of R&D, our engineering capabilities, our competent human resources, and our powerful sales network and achieved foreign sales of US\$ 211 million. The share of exports in turnover reached 65 percent, from last year's 31 percent. The contribution of our subsidiaries and affiliates in foreign countries and the increase of our exports had a positive impact on our profitability".

GÖRGÜÇ: "We are not only exporting products, but also technology"

Underlining that critical export agreements had an impact on the export success reached by Otokar, Serdar GÖRGÜÇ said, "Our two export projects which will continue in 2019. The deliveries that started last year made their mark in our 2018 performance. The first of these projects was the contract for the armored vehicle procurement for the Armed Forces of the United Arab Emirates. Our second success was our achievement in the bus tender launched by the Municipality of Bucharest. As a Turkish bus brand, we established a company for the contract containing the eight year after sales services in addition to the procurement of 400 in - city buses, which is the greatest bus export contract ever signed by a Turkish bus brand. When the Bucharest deliveries are completed, it will be the greatest city after Istanbul to which Otokar provides services with the greatest fleet".

GÖRGÜÇ: "Millions of passengers in over 50 countries are travelling with the comfort offered by Otokar"



Serdar GÖRGÜÇ - Otokar General Manager

Stating that Otokar has been developing solutions with its own technology, design and applications, compatible with the requirements of customers, and that the company has been continuing to strengthen its position in Europe with comfort, technology and low operation costs in its vehicles, GÖRGÜÇ continued, "Presently, Otokar buses are providing services in over 50 countries such as Spain, Serbia, Germany, Italy, Greece, Belgium, Romania, Poland, Hungary and Slovenia. As a result of the importance we attached to export activities, in addition to Bucharest, we accomplished critical bus deliveries to Germany, France, Poland, Jordan and Tunisia last year. This year, our 34 Doruk buses were launched into service as part of the transportation services of the Municipality of Warsaw in Poland. Our company, which won the bus tender for 100 buses launched by the Municipality of Amman - the capital city of Jordan - in March, received an additional order of 35 buses as a result of the customer satisfaction regarding the buses. We will be delivering new 35

buses to the Municipality of Amman in the spring of this year. This year, we completed the first exports of our city buses that are operated by natural gas, to Spain. In addition to our in - city buses, our vehicles for tourism purposes were admired by European users. This year, we offered Ulyso T, also known as Doruk in our country, to the German market. The sales of this vehicle also started in Italy, France, Belgium and Sweden.”

One out of Every 3 Buses Sold in Turkey was Produced by Otokar

Sharing information on Otokar’s sales in the Turkish market as well, Serdar GÖRGÜÇ said, “In 2018, the total bus market shrank by 29 percent and concluded the year with the sale of around 3,800 units. In the small and medium sized bus market this shrinkage was 23 percent, while in the market of buses with the length of over 12 meters and the in - city bus market shrinkage was 50 percent. Otokar designs and manufactures municipality and public buses in the passenger transportation segment in addition to buses used to transport personnel and buses for tourism purposes. For over 55 years Otokar has fulfilled all the expectations with its large product range and with the solutions offered according to user requirements as well as the after sales services. In 2018, almost one out of every three

buses sold in Turkey was an Otokar bus in the segments in which we are active.”

Stating that Otokar enjoyed the pride of becoming the leader for the tenth time in the same category by maintaining its leadership in the bus segments in which the company was active, GÖRGÜÇ said, “Our in - city bus deliveries across the country from Mardin to İzmir, from Tekirdağ to Antakya continued. By listening closely to the transportation industry, and through projecting the changing requirements, we continued product development activities uninterrupted. The admiration gained by our vehicles which were renewed last year and also as a result of the renewed positive forecasted outlook for the tourism industry for the second half of the year, our sales were affected positively.”

GÖRGÜÇ: “We will focus on exports to become a global brand”

Noting that Otokar started the year 2019 with new and critical targets, Serdar GÖRGÜÇ said, “This year, we aim to continue to be the first brand of choice for the in-city and touristic transport needs of the industry with our buses that are most compatible with expectations of customers. We aim to maintain our leadership in Turkey’s bus market. In addition to this, we will progress on the path of becoming a global brand by focusing more on the export activities in 2019. This

year, we will continue the delivery of the orders we received and strive to increase our presence in our target markets with our vehicles which will be developed especially for the foreign market. We aim to manufacture products and services with high added value in the most effective manner by correctly interpreting the expectations and requirements of our customers, keeping up with the swift changes in technology and benefiting from the opportunities brought about by digital technologies.”

First Lot of RABDAN 8x8 Armored Vehicles Started to be Delivered to the UAE

Moreover, as part of the financial results of 2018, the company mentioned that the first armored vehicles were delivered to fulfil the United Arab Emirates’ Armed Forces amphibious 8x8 armored vehicle demands. The contract is worth US\$ 661 million and was signed at the IDEX 2017. The report also read that additional COBRA-II orders were received from the Presidency of Defense Industries in accordance with the needs of the domestic security forces concerning the domestic military programs and the related deliveries were accomplished within 2018. It was also announced in the report that another order, valued at US\$ 28.9 million, for the COBRA-II 4x4 armored vehicle was received from an Asian country in 2018 ■



A-591 'Ufuk' - Test and Training Ship Launched

Turkey's first Test and Training Ship A-591 'Ufuk' was launched at Tuzla Shipyard with the participation of President Recep Tayyip ERDOĞAN, Minister of Defence Hulusi AKAR, Minister of Industry and Technology Mustafa VARANK, President of Defence Industries Prof. İsmail DEMİR and many officials from the defence industry and the military.

Taking the floor at the ceremony, STM Chairman of the Executive Board İhsan KAYA stated that they are very proud to make a significant contribution to the strength of the Turkish Naval Forces by using the capabilities of the sector at its finest level as the main contractor of the Test & Training Vessel (TVEG) procurement project under the leadership of the Presidency of Defence Industries and said: "STM signed the contract of the project with the Presidency of Defence Industries on December 30, 2016, and cut the first steel for the ship on May 2, 2017. We are planning to deliver our Test & Training Ship, which based on MILGEM corvette and will be launched today, to the Turkish Naval Forces Command on July 31, 2020, by completing it within 40 months."

President of Defence Industries Prof. İsmail DEMİR stated that MILGEM, Multipurpose Amphibious Assault Ship, Seismic Research Vessel, Submarine Rescue Mother Ship (MOSHIP), and New Type Patrol Boat projects, which were developed and produced by Turkish Defence Industry in the last years, were carried out with the devoted work of both military and private shipyards as well as defence companies. DEMİR said:



Prof. İsmail DEMİR - President of Defence Industries



"When we look at the current situation of the naval sector, we see that various projects that were acquired from abroad in the past are being realized by national means today. We have approximately 40 platforms which were built at both military and private shipyards and were delivered to the Turkish Naval Forces Command. In addition, we have around 20 platforms which are already contracted and undergoing construction and modernization activities." Prof. DEMİR ended his speech by thanking all the partners who contributed to the construction of the Test & Training Ship.

Minister of National Defence Hulusi AKAR: "The value of 650 major projects carried out in the Defence Industry exceeded US\$85 Billion"

Taking the floor following the speech of the President of Defence Industries, Minister of National Defence Hulusi AKAR stressed that improving and expanding the possibilities and capabilities of the Turkish Armed Forces based on an indigenous defence industry has become more relevant than ever, and continued as: "In this regard, our state has initiated a significant movement in the defence industry based upon our national values

and interests. With this approach, this country, which was exposed to an arms embargo in 1974, has now become a country that exports ships, unmanned aerial vehicles, and helicopters."

Emphasizing that the national and domestic approach has proven to be not just words, Minister AKAR indicated that the number of defence projects, which were around 60 in 2002, increased tenfold to almost 650, and underlined that the estimated value of these projects is US\$85 Billion.

Minister AKAR stated that the Turkish Naval Forces Command carry out its activities with perseverance and determination for the protection of the rights and interests on the 462 thousand square kilometers 'Blue Motherland' and said that it also plays a significant role in ensuring global peace and stability in different geographies.



Hulusi AKAR - Minister of National Defence

Stating that the 'Ufuk' A-591 Test & Training Ship serves as a model for the collaboration between public institutions, foundations, and the private sector, Minister AKAR said: "Within the framework of Turkey's vision of becoming a global power, I believe with all my soul that our public institutions, foundations, the private sector, and universities will achieve even greater successes for the security of our country and our future generations by working in complete harmony and synergy."

Expressing his gratitude to President ERDOĞAN for his sensibility, leadership, encouragement, and support for local and national projects, Minister AKAR said: "Our region is full of uncertainty, risks, and threats since actors, roles, and goals are constantly changing. Having an effective, deterrent and reputable army in such a geography as ours is not a choice but a necessity."

President Recep Tayyip ERDOĞAN: "The Ufuk Corvette is the first Intelligence Ship of our country."

President Recep Tayyip ERDOĞAN addressed the guests at the ceremony and said: "The challenging geography of our country forces us to have a strong position not only in the economy, agriculture, trade, industry, but also in intelligence. After the developments in the Eastern Mediterranean, the Aegean and the Black Sea as well as the threats from Syria, this need became more critical and more urgent. As I have always said, one cannot be involved in [negotiations] without being [active] in the field."

Indicating that this ship is the 5th MILGEM vessel after the "Kınalıada" corvette, which was launched 1.5 years ago, ERDOĞAN stated that with a maximum



Recep Tayyip ERDOĞAN - President of Turkey



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speed of 18 knots and a 10-tonne helicopter platform, the 'Ufuk' Corvette is the first intelligence ship of Turkey developed and built with national resources and capabilities. ERDOĞAN said: "Today, with the 'Ufuk' Corvette, we acquire this capability that only a few countries have in the world."

Stating that the 'Ufuk' Corvette will be able to immediately detect threats to our national security by continuously navigating in severe weather and maritime conditions, including international waters, for 45 days without interruption, President ERDOĞAN said: "I believe that the 'Ufuk' Corvette will fill an immense gap in today's world where preventive intelligence, especially signal intelligence is vital. On the seas, this ship will be the seeing eyes and hearing ears of Turkey."

Following the opening speeches, a gift was given to President Recep Tayyip ERDOĞAN by STM Chairman İhsan KAYA, to mark the memory of the day also with the participation of the protocol, a family photo was taken to commemorate the important day.

Following the ready-for-launch report, Minister of National Defence Hulusi AKAR's wife Şule AKAR expressing her wishes "May you bring good luck to the country and the nation, wave our glorious flag on the seas." and symbolically cut the rope which tethers the ship to the cradle and the A-591 'Ufuk' Test & Training Ship was launched.

A-591 'Ufuk' Vessel is Scheduled to be Delivered to the Turkish Naval Forces Command on July 31, 2020

The contract between the STM and the SSB was signed on

December 30, 2016, in the Test & Training Vessel program after the tender process was completed in the last quarter of 2016 by the Presidency of Defence Industries. Under the program with STM as the main contractor and Istanbul Shipyard as the subcontractor, the first steel was cut on May 2, 2017, and the construction activities of the ship officially started.

Within the scope of the program, while STM carried out the conception and design activities; system, equipment, material, and instrument selection; manufacturing equipment and blueprint preparation; test and verification procedures; and Integrated Logistic Support (ILS) documents, Istanbul Shipyard carried out the construction and outfitting activities. TVEG, built as 30 blocks, was completed on July 24, 2018, by assembling on the cradle including the superstructure and mast. During the construction process, 920 tons of steel plate, 12.5 tons of aluminum, 6340 meters of pipe were assembled together, in addition, the main systems of the vessel were installed prior to launching. The A-591 'Ufuk' Corvette, with its command control, electronic systems, test, and training system equipment to be provided by Aselsan, is intended to be used in signal and electronic intelligence missions (SIGINT/ELINT) in addition to the Test and Training vessel requirements of The Turkish Naval Forces.

The vessel, with a length of 99.5 meters, a beam of 14.4 meters, a maximum speed of 18 knots and a 10-ton flight deck, is scheduled to be commissioned by the Turkish Naval Forces Command on July 31, 2020 ■

Ankara Chamber of Industry 55th Anniversary Award Ceremony

The Ankara Chamber of Industry 55th Anniversary Award Ceremony was held at the ASO 1st OSB Conference Hall with the participation of Minister of Industry and Technology Mustafa VARANK. Deputy Minister of Industry and Technology Hasan BÜYÜKDEDE, Gazi University Rector Prof. Dr. İbrahim USLAN, Deputy Governor of Ankara Recep ERKILIÇ, Managing Director of Industrial Zones Ramazan YILDIRIM, ASO Board of Directors, Assembly and Committee Members, ASO 1st OSB Chairman of the Board Niyazi AKDAŞ and board members, industrialists, bureaucrats, mayors and many guests attended the ceremony hosted by the Ankara Chamber of Industry (ASO) President of Board of Directors Nurettin ÖZDEBİR and ASO President of Assembly Celal KOLOĞLU.

Taking the floor at the ceremony ASO President of Board of Directors Nurettin ÖZDEBİR said: "The recent trade and exchange wars have revealed that the greatest strength of countries is production." Underlining that Ankara has a special place in achieving the economic development goals of Turkey with its industrial infrastructure, entrepreneurial potential, and qualified workforce, ÖZDEBİR stated that Ankara played a critical role in achieving Turkey's foreign trade goals with its exports to over 200 countries by the end of last year. ÖZDEBİR said: "As ASO, we have worked hard for the mental transformation of our industrialists. Today, Ankara has realized 14% of the high technology patent/utility model applications. Ankara hosts 15% of R&D producers, 13% of high technology production, 28% of R&D engineers, and 20% of high technology investments."

ÖZDEBİR: "The greatest strength of countries is production"



Indicating that Ankara has a distinct production culture, understanding, and vision with nearly 4 thousand exporters, ÖZDEBİR expressed that with high and medium-high technologies comprising 40% of their production, industrialists in Ankara are an example to the whole country with these visions. Emphasizing that the economic contraction in Turkey is also felt on a global scale, ÖZDEBİR stated that there is a decline in both international trade and global industrial production. ÖZDEBİR also noted that the Purchasing Managers' Index fell in Germany and China and continued:



Nurettin ÖZDEBİR - ASO President of Board of Directors

"Domestic demand and production volumes of countries are shrinking. Despite this, with 82 million young, dynamic, and enthusiastic population, our country will be able to overcome these days in an effortless manner, given that we live in unity and solidarity. The recent trade and exchange wars have revealed that the greatest weapon of countries is production. In this period, where production processes expanded on a global scale, we are now aware of the importance of R&D."

ÖZDEBİR emphasized that a sustainable economic growth phenomenon will come true thanks to the opportunities provided by technological innovation and R&D. He stated that the world is currently going through a 4th Industrial Revolution with artificial intelligence, robotic technologies and the internet of things.

Nurettin ÖZDEBİR stated that every stage of the production chain has been digitized and there is a paradigm shift in the industry with intelligent production systems: "This process unequivocally changes all balances and the entire business ecosystem. In this process, the traditional manufacturing industry is being replaced by production systems integrated with information technologies. It is now a necessity for our industrialist to be fully prepared."

Minister of Industry and Technology Mustafa VARANK: "Ankara 1st Organized Industrial Zone will grow by 10 million square meters"

In his speech, Minister of Industry and Technology Mustafa VARANK said: "We believe in our industrialists and work with all our strength to solve the problems they face and implement their innovative ideas." VARANK also stated that the awards given in the fields of R&D and entrepreneurship are meaningful to show ASO's awareness on the issue.

Highlighting the fact that 30 of the 55 companies that received awards benefit from the incentives of the ministry, VARANK said: "We provided incentives to the fixed capital investments worth TL8 Billion for these companies and created additional employment opportunities for 7 thousand people."

VARANK stated that currently, 26 companies receive KOSGEB support and 29 businesses benefit from various advantages with their R&D Center Certificates given by the ministry: "Eleven companies among us received TL3.5 Million of project support from the Ankara Development Agency. Thus, a 17% increase in 2018 exports and achieving fifth place in Turkey is not a coincidence."

Emphasizing that the intensive efforts of the industrialists, combined with the support provided by the state, brought a strong industrial infrastructure to Ankara, VARANK stated that there are positive developments regarding the 1st OSB, that it will grow by 10 million square meters and this figure means around 300 new factories and additional employment for 50 thousand people.

VARANK indicated that the expropriation activities will start this year and the necessary investments will be made within the next 2 years.

Addressing the 2018 performance of existing companies, VARANK made the following assessments: "I've seen that more than 10 companies spent over TL500 Million on new investments, all of these companies have strong



Mustafa VARANK - Minister of Industry and Technology

export potential. The 1st OSB is a role model for Turkey regarding the vocational training-employment relationship. 97% of the young students, educated under the Vocational Training Project and Industrial Vocational Training Center, were employed in the first company that they started in as interns. Considering the fact, that the average employment rate during training is 15% in Turkey, our biggest wish is to spread this spectacular performance of Ankara 1st OSB in vocational training to the whole country."

Stating that when given appropriate opportunities, young people produce immense results, VARANK shared that educating and preparing our young and dynamic workforce in the best way possible for life will be accomplished with the cooperation of both the public and private sector. VARANK stated that, as the ministry, they place special importance on the policies that will

increase employment in the industry for both vocational high school and university graduates and said that the Industrial Doctorate Program brought a new perspective in this context.

VARANK underlined that their aim is to educate and train the qualified workforce needed in the industry with the cooperation of the real sector and academia and then to employ them: "Two weeks ago I was at the signing ceremony of projects that are eligible for support. If our students are employed in the industry after graduation, we will provide salary support ranging from 40 to 60 percent for 3 years. I have high hopes for the participation of our industrialists in this program. Qualified human capital is the most important component of sustainable development."

Highlighting the fact that we need to manufacture and export high value-added products in order to advance in global competition, VARANK asserted that the "National Technology, Strong Industry" vision is intended for this purpose. VARANK stated that they aim to reduce import dependency in production while focusing on achieving structural transformation towards high value-added areas: "Our goal is to support all the processes of the product starting from R&D to commercialization and to maximize domestic added value. For this purpose, we are working on a model that takes a holistic approach to all the support provided by our ministry and related institutions. We are also



carrying out another study to make arrangements for encouraging the purchase of domestic goods in the public sector.”

Recalling the Union of Chambers and Commodity Exchanges of Turkey Economic Council meeting, VARANK voiced that numerous industrialists called for the state to support localization through public procurement.

VARANK stated that as the ministry, they embraced this matter and determined the insufficiencies of the current system: “We developed a model that is simpler, more efficient and which takes into account domestic added value. Our ultimate goal is to increase domestic production quality in a competitive manner by spreading the consciousness of domesticity throughout the public and the industry. Thanks to economies of scale to be created by the public, we will protect our domestic productions against cheap imported products, and we will achieve continuity in domestic production.”

VARANK indicated that there is a rapid technological change and transformation process and stated that the necessary steps should be taken by evaluating its risks and opportunities. Explaining that they expect to see productivity and added value increases as a result of learning-by-doing first in Ankara and then in neighboring provinces, VARANK stated that a development process consisting of only a few cities in industrial and technological progress enough is not sufficient enough. Underlining that in order to increase production, innovation and R&D activities, the potential of cities should be utilized in the best way possible, VARANK said: “As we mentioned in our election manifesto, we set a goal for our ‘Unique Cities’ program. We will prepare development models suitable for the geography, climate, human capital, and growth areas of each city, and implement our domestic and national production priority.”

Highlighting the fact that they have taken steps in order to transform OSBs into branding centers with investment appeal



and make them operate with full capacity, VARANK said that they made it possible for OSBs to become more investment-friendly production sites by making an amendment to the regulation last week.

VARANK stated that with the new simplified regulation, they aim to guide investors to the industrial parcels and revitalize the OSBs thus they will accelerate the land allocation processes in OSBs and obtain complete information on unallocated parcels.

Emphasizing that they aim to prevent speculative land allocation and sale, VARANK said: “The new regulation will prompt the completion of investments. In the industrial parcels of OSBs, waste-to-energy plants can be established, and administrations will be able to open facilities that produce electricity from solar and wind power. I believe we will witness the concrete results of these changes. We consider creating a stronger industrial infrastructure as our greatest responsibility. We believe in our industrialists and work with all our strength to solve the problems they face and implement their innovative ideas.”

Following his speech, Minister VARANK gave awards to TAI, Türk Traktör, and Dorce Prefabricated

companies. ASO President of Board of Directors Mr. Nurettin ÖZDEBİR and ASO President of Assembly Mr. Celal KOLOĞLU also presented a gift to Minister VARANK to commemorate the important meaning of the day.

A total of 55 awards were given at the ceremony. In the defense industry category, TAI was granted the Export and Created Added Value award; Aselsan was granted awards for R&D/Patent, R&D/SANTEZ-TEYDEB, R&D/Domestic Production and Created Added Value awards; ME-GE Teknik was granted R&D/R&D Center awards; CES Advanced Composite & Defence Technologies Inc. was granted R&D/R&D Center awards; Altay Information Technologies, Defence and Industrial Trade Inc. was granted R&D/R&D Center awards; NUMAŞ was granted R&D/Technology Product awards; Akana Engineering was granted R&D/Technology Product awards; Roketsan was granted Created Added Value award; and Seçkin GÜRLER on behalf of Yagris Network was granted the Young Entrepreneur award, in addition, ASO “Living Legends of Industry” special awards were also granted to their owners by ÖZDEBİR and KOLOĞLU ■





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FNSS Ready for IDEX 2019

FNSS completed all preparations to attend IDEX 2019, which will be held in Abu Dhabi, the capital of United Arab Emirates. The Anti-Tank Remote Turret (ARCT), Pars III 8x8 with SABER-25 Turret and TEBER-30 Turret System will be displayed at the FNSS stand in hall 10; stand number C-5.

FNSS developed the ARCT for the Turkish Land Forces Anti-Tank Vehicles (ATV) Program. The ARCT was developed utilizing state-of-the-art technology, the most current design approaches and combat experiences by the users. As an indigenous development project, the ARCT

was designed from the onset as a dedicated ATGM turret. This particular feature has been instrumental in the attainment of a highly effective solution in terms of missile effectiveness and system survivability.

Completing its 30th year in the defense industry, FNSS is ready to be a pioneer of future man power operated turrets integrated with both wheeled and tracked armored vehicles by using cutting edge technology and user centered designs. The SABER-25 and the TEBER-30 turrets incorporate the latest technologies in turret drives, fire control, protection and lethality.

With its compact dimensions and lightweight features, the SABER-25 a suitable choice for different types of armored vehicles. The TEBER-30 can work night and day under all weather conditions and battle environments thanks to its integrated sensors and other electronic systems. Both the gunner and the commander are able to control all functions of the turret.

IDEX is the biggest exhibition in the Middle East region in terms of international participation and visitor profiles. FNSS, the top exporter for land defense systems from Turkey, will participate in the Turkish Pavilion.



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Leonardo: Digitizing Land Forces of the Future

Leonardo Group, based in Italy is a global player in the high-tech sectors and a major operator worldwide in the Aerospace, Defence and Security Sector. A media tour was organized in order to provide a comprehensive and qualified view of the overall capabilities of the Group Companies in the land domain [focusing on land systems products and solutions such as; C4I Systems, Radar Systems, Optronic Systems, Cyber Secure Communication Systems, Weapon Systems and Ammunitions]. Defence and aerospace correspondents from international media organizations were invited to attend as well as selected journalists from potential partner/export countries

Defence Turkey, as one of the leading defence and aerospace magazines in Turkey was invited to take part in the tour. Leonardo Group companies have actually been doing business with Turkey for more than 40 years. The event was yet another opportunity to get a firsthand and up-close look at Leonardo's continued achievements and initiatives, on site. The first day of the tour included a visit to Leonardo's site in Campi Bisenzio near Florence province, where the company develops and manufactures electro-optical systems for land applications, followed by a briefing on the digitization of the Land Forces. The second day of the tour included a visit to the Italian Armed Forces' shooting range site of Monte Romano near Viterbo to attend the second Session of Operational Integration (SIO) 2018, led by the "Aosta" Brigade as part of the Forza NEC (Network Enabled Capability) trial sessions.

During the two-day event participating international media organizations received briefings given by Angelo PANSINI, Competitive Analysis & Strategy Director- Land and Naval Defence Electronics Division and Andrea GAGGELLI, Head of Sales – Optronics Systems Lob- Land and Naval Defence Electronics Division on the most recent technological innovations in the sector, as well as on Leonardo's market prospects and international campaigns. Press members also had a tour of the Optical Manufacturing department, Mechanical Manufacturing Department, Assembly Integration and Testing Departments and clean rooms on site and were given an informational briefing by Giovanni Scimia, Head of Optical and Mechanical C.o.E-



Optronics systems lob. and Pietro MARIGLIANI, Head of Assembly Integration and Test Campi Bisenzio.

The Campi Bisenzio site is dedicated to the design and production of electro-optical systems for land and space applications, naval radar and equipment for safe professional communications. It employs about 1,000 people (of which more than half are graduates degree) and covers an area of 54,000 square meters. In the defence sector, the Campi Bisenzio plant is involved in various programs for the supply of sensors and optronic systems to the Italian Army; among these, the night-time and multi-function vision systems of the Soldato Futuro program, as well as sensors for military vehicles (including VBM Freccia and Centauro, which are already used in operating scenarios). The site has designed and built optronic systems for the new frigates of the Italian Navy, including those used in the Mare Nostrum operation, as well as optronic sensors for various foreign customers in the terrestrial and naval sectors.

Campi Bisenzio is one of the three production sites that Leonardo operates in the Tuscany region with a total of about 1,800 employees. For the Group, the Tuscany region represents an area of excellence

where some of the Company's top activities coexist and technologies dedicated to the defence, security and space sectors are developed. The other two production facilities are; Montevarchi, in the province of Arezzo and Livorno. As a center of excellence in the aeronautical equipment sector the Montevarchi site is dedicated to the creation of human-machine interface systems, control panels, electronic units and cockpit screens together with lighting systems for military and commercial aircraft. As the plant of the Defence Systems Division of Leonardo, the Livorno site is dedicated to the development, production and marketing of all the major advanced underwater products, including heavy and light torpedoes, control and launch systems of torpedoes, anti-torpedo defence systems, artificial targets for torpedoes, and anti-mine sonars. It is also specialized in underwater surveillance systems for harbors, coastal areas and strategic sites and in countermeasures by ship and submarine with its launchers, underwater technologies for coastal protection and offshore platforms and unmanned systems, dealing with all aspects related to product marketing, including design, development, adaptation, production, sales and after-sales.

Leonardo's Capabilities in Land Systems

Current worldwide scenarios are ever-changing and conventional threats are combining with new asymmetric ones. In the face of these constantly evolving challenges, Leonardo Group can provide all Armed Forces with secure communications, information superiority, situational awareness, agile command capability and full control of its own sensors, assets and weapons.

Leonardo Group provides and integrates sensors, platforms, weapons and complete C4I solutions, from strategic to tactical levels, into fully fledged systems for Armies, Air Forces and Navies. Exploiting state-of-the-art technologies, their solutions guarantee real-time sharing of tactical information between platforms and command posts and include advanced applications that increase automated support to military commanders at all operational levels. Their interoperable C4ISTAR systems maximize the value of all manned and unmanned sensors deployed on and above the battlefield.

As a market leader in Battlefield Digitization Programs, Leonardo provides all deployed Land Forces, from the single soldier to combat vehicles and to the entire Brigade/Division, with the equipment necessary for successful military operation performance, also in joint or multinational environments.

The Group owns a complete portfolio of advanced and battle-proven products, which includes ground-based radars, fire control systems, guns, optronic systems, persistent surveillance networks, mission planning systems and interoperable, high data rate communication solutions.

They deliver highly effective turnkey and stand-alone solutions that meet even the most challenging Air Surveillance and Defence requirements. Leonardo provides effective protection against all air and missile threats, including ballistic missiles, for both homeland defence and expeditionary environments, leveraging a number of in-house produced high-tech sub-systems and components.

The Leonardo Group's long-range radars (such as RAT-31DL/M, RAT-31DL, KRONOS Land, KRONOS Grand and KRONOS Dome), both

LEONARDO
LAND & AIR FORCE SYSTEMS

Air Defence Systems

Air Defence systems provide advanced surveillance and protection capabilities against air and missile threats, including ballistic missiles. Turn-key solutions may also protect blue forces and strategic assets at major events, or safeguarding critical network infrastructures as well as Naval force fleets.

Air Defence Systems leverage a number of in-house produced key sub-systems and components, including radars, command and control facilities, communications networks, and electronic warfare suites as well as the superior capability to integrate existing assets.

Mobile

- SOC: Stand of Operations Control
- EUROFLEET: Multi-Functional Radar
- EUROFLEET: Multi-Functional Radar
- TRACER: 3D Long Range Radar
- TRACER: 3D Long Range Radar
- TRACER: 3D Long Range Radar
- TRACER: 3D Long Range Radar

Fixed

- ASDC: Air Defence Control Centre
- RAT31DL: 3D Long Range Radar
- KRONOS GRAND: Multifunctional Radar
- TRACER PLUS: Fire Control System
- RAT 3000C: Precision Approach Radar

© Leonardo - Standalone system

Key Features:

- MANAGE NETWORK OVER 100 NET-OF-RADAR SYSTEMS IN THE EUROPEAN REGION
- MANAGE AIR DEFENCE OPERATIONS IN THE BATTLESPACE AS TO ACOA SYSTEM
- ASCA RADAR: NEXT GENERATION IN SERVICES WORLDWIDE
- LINK 16 COMMUNICATIONS SYSTEMS: IN A LINK 16 NETWORK WITHIN 16 NATO COUNTRIES

in fixed and deployable versions, well-proven and robust, have been integrated with the most modern command and control systems, providing all the early warning air surveillance and tracking functionalities necessary for national airspace control and for management of air operations.

Leonardo's turnkey systems guarantee effective surveillance and defence of national borders and territory, coastal areas and waters. Their solutions enable net-centric operations of Border Guards, Patrol Units, Special Forces and of all Armed Forces involved in the protection of the homeland. The offer is complemented by integrated Logistic Support solutions that include full training, also using realistic simulation of the operating environment, and in-service system support, so to ensure a long product lifecycle and to maximize the customer investment value.

Battlefield: Turnkey integrated systems for Battlespace Digitization,

for full-scale integration of fixed, mobile and dismantled units. C4I solutions for the digital battlefield (Coalition and Multinational, Joint Operations, Single Service, Tactical and Battlefield Systems). Tracked and wheeled land armored vehicles (Centauro, Freccia), equipped with turrets (HITROLE, HITFIST, HITFACT), guided and unguided ammunitions (Vulcano, DART).

Optronic Systems: infra-red detectors and cameras, for soldiers or vehicles, tactical ISTAR and battlefield systems (Janus), fully fledged Vehicular Systems.

Tactical command, control & communication systems for ground platforms and dismantled soldiers: software-defined radios (SDR), Electronic Countermeasures, HF radios and networks, tactical IP-based land networks (Sentinel), radio relays, satellite communications, data compression technology and RF antenna modelling and simulation.

Force Protection Solutions for multi-layer protection of Forward



HITROLE Light Weight CROWS

Operating Bases (FOB) integrate a wide range of detection, tracking and identification devices: surface radars and CRAM systems, electro-optical sensors, acoustic-based sensors and unmanned systems, with highly modular and automated Command & Control systems.

Air Surveillance & Defence:

Solid state phased array 3D surveillance radars RAT-31DL (for fixed defence) and RAT 31DL/M (for deployable tactical long-range operations). KRONOS multi-mission AESA radar family provides superior detection and tracking accuracy to counter all threats, including cruise missiles or UAVs, flying at low altitude, or tactical ballistic missiles. Available in both fixed and mobile configurations and integrated with top class medium and short-range missiles, KRONOS radars can support both air surveillance and fire control at the same time, with each radar capable to drive multiple missiles against multiple targets.

Radar integration and command & control systems, tactical & strategic communication networks, fire control systems, secondary radar for Identification Friend or Foe (SIR-M), Precision Approach Radar (PAR2090C), deployable ATC systems and weather radars.

Coastal Surveillance & Border Control Systems: Systems that integrate specific sensors: air and surface surveillance radars (ARGOS, Lyra), passive radars (Aulos), short to long range thermal imaging day/night cameras and multi-sensor systems (Janus, Horizon, Nerio, Observer), acoustic systems (HALO, Hydra) and unmanned systems, with tailored Command and Control systems for fixed or mobile situational awareness and fire control.

Italian Smart Soldier System

Leonardo is a global high-tech company, one of the key actors worldwide in Aerospace, Defence and Security, and the Leading Company in Italy, partner of reference for all Italian Armed Forces.

As such, the Company is presently providing to the Italian Ministry of Defence an integrated set of systems and services for the "Digitization of the Battlefield". The Program, mostly oriented to the needs of the Land Based Forces, aims to enable them to operate with

state-of-the-art sensors, weapons, vehicles and communications, exploiting all the benefits deriving from digital and distributed Command and Control systems.

From the Soldier point of view, the project is providing a set of modern equipment that facilitate the operations of the fighter on foot, at the same time maximizing the offence/defence capacity and increasing the safety. The Smart Soldier Project is aimed at the transformation of the single soldier in a "human hosted platform" able to operate in teams, whether embarked on infantry vehicles or on foot, and always in continuous and full connection, through the vehicles operating in the battlefield, with the command chain.

The Smart Soldiers are so enabled to operate using the same and the most updated "digitized" information, made available via the armored vehicles in their proximity, from the functional point of view becoming nodes of a digital network that links without distinction all the different platforms (Soldiers, Armored Vehicles, Command Posts) present on the tactical scenario.

It is not just about ensuring voice connectivity but above all about providing an additional data connection that relentlessly feeds Leonardo applications designed to generate, in real time, the appropriate level of "cognitive superiority" of each single soldier, a fundamental element for the successful outcome of military maneuvers in the operational theaters.

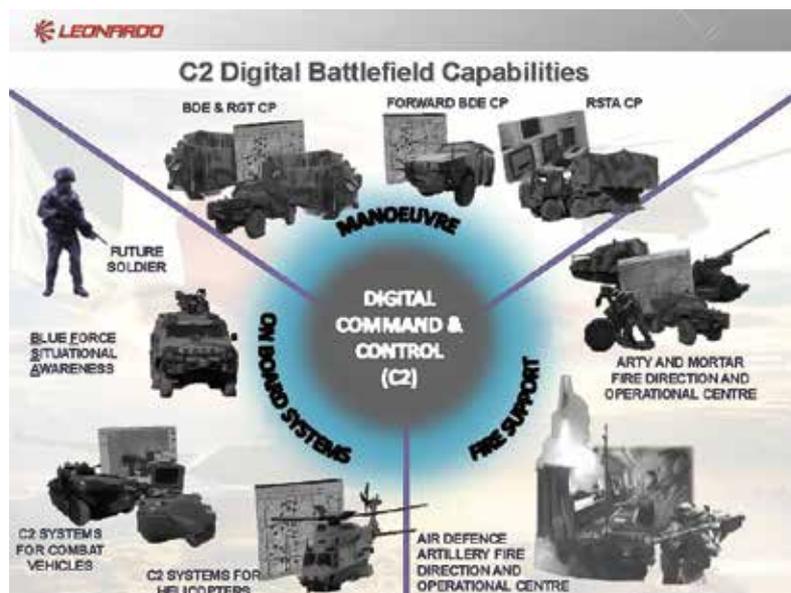
The equipment portfolio of the Smart Soldier enhances his capability in five areas:

- › Lethality, as the ability to detect, recognize and attack targets
- › The ability to use information and communication services to improve perception of the surrounding environment, to receive orders from the chain of command and to provide the Commanders with real time operational information and reconnaissance data
- › Survival capability, with integration of bulletproof vests and Nuclear Biological Chemical (NBC) protection
- › Mobility, indoor and outdoor, in all weather conditions, 24-hours-per-day, with night and computer assisted vision systems and equipment for autonomous navigation
- › Sustainability, i.e. the ability to conduct autonomous and prolonged operations, for up to 24 hours, reflecting the total available quantity of power for the C4I electronic systems, ammunition, food, beverages and other consumables

The Smart Soldier capability is fully scalable, modular and configurable. The system can be provided in many incremental configurations, covering a wide range of operational and technical requirements. The solution includes the following sub-systems:

- › Command & Control
- › Communications
- › Sensors
- › Support & Autonomy

Thanks to its modular architecture, the SMART SOLDIER Solution satisfies a wide variety of end-user needs, including, if required, the tailored integration of GFE (Government Furnished Equipment) components and sensors.



Command & Control Sub-system includes the following key components:

- › Command & Control (C2) software application
- › Wearable Rugged Computer

Command & Control Software Application: The Tactical Command and Control (TC2) Software provides services such as Navigation and Situational Awareness (where I am, where you are, where are the enemy) using digital raster maps overlaid with all mission relevant entities. These are enriched with navigation features (zoom, pan, routes and waypoints management). An efficient dissemination mechanism based on Standard Interoperability Protocols allows data exchange among soldiers in real time in a timely and optimized way. TC2 helps the operator to prepare and exchange orders, and report, sends text messages and facilitates the graphical management of orders, image processing.

TC2 also provides an Augmented Reality capability by the integration with TM-NVG sensor devices. With this capability the SMART SOLDIER can operate directly having the information needed for the operation superimposed on the optical display. Functionalities like Situation Awareness and Navigation are also provided.

The Situation Awareness provided by the TC2 software is displayed on the TM-NVG in two synthetic modes:

- › The geo-registered icons with the distance for the Entities in the field of view
- › The Situation Awareness Ring that reports all the Entities around the SMART SOLDIER (inside and outside the field of view)
- › The Navigation is provided by specific geo-registered icons with their distance, if in the field of view, or with direction and distance, if outside of the Situation Awareness Ring
- › The software architecture is open and may be customized, modifying existing functionalities of the man-machine interface or adding new ones to meet emerging end-user needs

Communications Sub-system provides the soldier with specific communication means to interconnect with the other members of the squad. It includes the following components:

- › Software Defined Radio SDR for the Soldier
- › Headset / Microphone

Software Defined Radio (SDR)



Dismounted Soldier Systems

C4i, Lethality, Survivability, Mobility and Sustainability are achieved through the dismounted soldier solutions. Assets are a C2 capability through wearable computer and display for access to Situational Awareness, navigation, local operative picture, reporting and planning functions

Optronic sensors are integrated to complete the ISTAR soldier capabilities through target acquisition devices, night vision systems and cameras. The power supply system has been tailored to meet the demands of the assets, ensuring the autonomy and sustainability of the soldiers throughout the mission



for the Soldier: The Software Defined Radio (SDR) Hand-Held Evolution (HHE) is an individual VHF and UHF multi-band pocket radio to provide high speed communications at Platoon and Squad level with full IP support. It also gives the soldier enhanced capability thanks to automatic data and voice relay, significantly extending the coverage over the area of the operation. In order to increase its combat effectiveness, the radio includes an integrated GPS, and, for voice communications, it can be operated via a wired press-to-talk (PTT) unit or through a wireless PTT integrated into the soldier's rifle. Operating in the 30MHz to 512MHz range, the SDR HH allows independent voice and data transmission.

The selectable waveforms include the VHF narrowband waveform for rural open environments, guaranteeing a range of up to 5km with an effective data rate of up to 50Kbps in Fixed/Fast Frequency Hopping mode to cope with spectrum constrained and hostile electromagnetic environments (Friendly or Hostile). The UHF MANET Wideband Soldier Broadband Waveform (SBW) for urban environment offers an up to 2km range with an effective data rate of up to 470Kbps.

Once delivered the SDR, thanks to standard Software Architecture (SCA and ESSOR), it can be upgraded with existing or new MIL-STD, STANAG, NATO or legacy waveforms as they are made available or developed, thus protecting customer's investment. It meets the most stringent military

standards for electrical, mechanical and environmental conditions.

Headset/Microphone audio accessory provides connectivity to radio devices. A wide range of audio ancillaries are available to satisfy specific operational needs, including headsets with noise blanking capabilities and In-The-Ear devices with hearing protection.

The electro-optical equipment includes the day and night observation and pointing systems Mini Sight, the SCORPIO grenade launcher fire control system; LINX multi-functional binoculars for observation and locating objectives, the TM-NVG night mobility system fitted into the helmet.

MINI SIGHT 640 AC is an advanced new generation Miniature Thermal Weapon Sight with Situational Awareness Capability and C4i Interface. It can be integrated with NIMOS system or with other C2/C4i systems to provide snapshots or video stream. It is designed to be used by the "Future/Digital Dismounted Soldier" as a Hand-Held or Helmet mounted Mono-Scope or light TWS on rifles' standard "Picatinny" rails.

Mini Sight 640 AC provides an outstanding image quality within a small Size, Weight And low Power (SWAP), with special features and extended operating time and performance system.

SCORPIO is a lightweight, compact, high hit-probability, Fire Control System (FCS) for grenade launcher tubes that provides fast and accurate aiming and firing (LOS/LOF) capabilities.

A ballistic computer reconfigurable by means of uploaded firing tables for selected ammunition (HE frags, HEDP, Smoke, etc.) provides enhanced hit probability against standing and moving ground targets.

LINX & Cooled LINX: LINX is a multi-functional hand-held target acquisition system which includes a thermal imager for all-weather observation and detection, an eye-safe Laser Range Finder, a Digital Magnetic Compass, a Global Positioning System (GPS) receiver, BT and Wi-Fi housed in a compact lightweight unit used by dismounted soldiers and Special Forces.

It is designed to be "NET-centric", i.e. integrated in a network via a wireless (but also wired) connection allowing the user to be in his center with the possibility to exchange information (images and data) with the rest of the system.

LINX is a fully integrated device for a real "Target Locator" and performs target acquisition through a target data record that provides target marker, azimuth, elevation, distance, global positioning and a target snapshot of the scene in InfraRed (IR).

ALICE HH is an uncooled thermal imager based on a state-of-the-art, high-resolution focal plane. The advantages of uncooled IR technology mean that there is no need for cryo-cooling devices. This results in a significant reduction in weight, size and power consumption, together with an overall improvement in reliability, operational readiness and portability.

ALICE HH is the ideal solution for applications where small size and low weight are required (reconnaissance forces and special units; security and perimeter defence forces, etc.)

ALICE HH can also be fitted with a laser range finder by means of a Picatinny rail (optional) to be mounted on the upper part of the equipment's body.

TM-NVG (Tactical Mobility Night Vision) is multi-purpose night vision products connecting the battlefield user with various applications, as well as command headquarters, to enhance situational awareness.

TM-NVG increases operational effectiveness in both nighttime and daytime missions and provides the soldier with real-time video access to critical tactical intelligence. TM-NVG it is fitted into the helmet.



ARC4 Module is a heads-up situational awareness (SA) device that supports military/tactical and industrial/commercial operations. The product mounts to a helmet rail and renders geo-registered symbology on the operator's real-world view through a night vision goggle or daytime heads-up display.

In a heads-up and eyes-out posture, the operator can navigate to points of interest, track team elements, designate marks in the environment and share with networked users and send messages and commands.

Support & Autonomy sub-system provides the soldier with a Centralized Power Supply system with the following main capabilities:

- › Centralized power supply source for the C4I electronic equipment of the Future Soldier System that considerably extends the time duration of the soldier's mission
- › The ability to regenerate the system using an external power source

The Centralized Power Supply system is based on the following components:

- › Power distribution
- › Rechargeable Battery

The system architecture is modular in order to allow both a better ergonomics and distribution of the components on the soldier body. The Power Distribution unit distributes the energy of the battery to the Smart Soldier System device and controls the consumption and status of the connected battery.

The Rechargeable Battery made with rechargeable Lithium-Ion cells, is able to power the SMART SOLDIER System and guarantees

an estimated operability of up to 8 hours; Additional battery packages, carried in the rucksack, can be used for longer missions.

Vehicle Integration

Capabilities: Leonardo experience in the Soldier System domain also includes the management of all aspects related to the integration of the soldier system with vehicular platforms.

Vehicular integration is supported at communication level (between Soldier Radio and intercom), C2 level (soldier C2 - vehicle BMS data exchange) and power level.

The "Digital Battlefield" Concept

Leonardo is supporting the Italian Ministry of Defence (MoD) in the development and implementation of the Network Enable Capabilities (NEC), with the aim to pursue and maximize the operational effectiveness thanks to the sharing of digitized information.

Key objective of the **FORZA NEC Program** is the deployment of a state-of-the-art Land Force at Divisional level, based on three Land Brigades, a Landing Force and relevant enablers, all equipped with platforms, systems and stand-alone products fully integrated in a digitized and networked infrastructure.

Key characteristic of the **FORZA NEC Program** is the initial **Concept, Development & Experimentation Phase** (CD&E), finalized to verify, validate and test the capabilities to be following intended to the series production/spin-off phases ■

Cyber Attack Threat Increases in the Civil Aviation Sector

ThinkTech is the Technological Think Tank of STM Savunma Teknolojileri Mühendislik ve Ticaret A.Ş. and stands out with its cyber security studies with the guidance of the Presidency of Defense Industries. ThinkTech recently published their Cyber Threat Status Report covering the last quarter of 2018 (October-December) on January 18, 2019.

In the year-end report where the diversification of cyber-attacks is reported, it is evaluated that in 2019, the custom attacks that target especially critical infrastructure as well as cyber spying will increase, machine learning and artificial intelligence capabilities will be used in cyber-attacks, new generation malware attacks having Anti-Sandbox skills, biometric security systems attacks, Ransomware attacks will target cloud platforms (data storage and service hosting services, etc.) LoT environments and critical infrastructures. It is also underlined that the number of cyber-attacks that affect the civil aviation sector will increase.

The aviation industry, which has been developing rapidly in the world and in our country, is the target of cyber-attacks directly or indirectly, especially through the software used. Since the aviation industry is directly connected with many critical sectors such as transportation, communication and energy, the risk area is expanding further.

In STM ThinkTech's the Cyber Threat Status Report, it is stated that hundreds of electronic applications in the aviation industry have become the new target of hackers. It is evaluated that many cyber threats, such as controlled the engines via in-flight entertainment systems, security gaps in the ticketing system, credit cards of the customers and the capture of their personal information will increase in the aviation sector in 2019. The report foresees that cyberattack activities



could put flight safety at risk and may threaten their safety and lives, causing great economic losses.

even smartphones and acting as fingerprints of many people.

Malware in Mobile Banking Applications

The Cyber Threat Report emphasizes that the number of malware targeting mobile banking applications increased in the last period of 2018, while malicious applications uploaded to the Google App Store targeted banks' end users using Android operating systems; Identity / Customer Numbers and passwords of individual customers were stolen. In the report, it is stated that the applications that take the permissions of reading and sending SMS of the individuals constitutes a threat for customers, and the investigations revealed that the developers of these harmful applications have the same structure and contents except for the names.

Security Vulnerability is being Created Through False Fingerprinting

The report also highlighted increasing cyber threats on biometric recognition systems. One of the most popular security methods used today are biometric recognition systems and they are threatened by fake fingerprints generated by machine learning and such fingerprints also put data security at great risk by cheating

The Importance of Cyber Fusion Centers on the Rise

The Cyber Threat Status Report emphasizes that security threats encountered in cyber space, which is an increasingly difficult area to control, contain many risks, and it is stated that in this framework, while institutions are exerting efforts to increase their cyber defense capacities, attackers are developing new methods. While the Report indicates that it is becoming important to integrate cyber security activities in today's threat environment into Cyber Fusion Centers in order to reduce risks and to ensure the sustainability of operations. It is also noted that the cyber threats and attacker capabilities rapidly are bypassing traditional threat detection technologies. The average number of days required to detect an information security intrusion has reached 146 days. With the rapid evolution of cyber threats, the report states that many institutions are still unable to identify cyber vulnerabilities in a short time on their own, and such institutions need a cyber-fusion center to combine real and technical information in a comprehensive environment that can be interrelated in order to protect and defend corporate networks properly.

OSSA's 5th Ordinary General Meeting was Held in Ankara

The OSTİM Defence and Aviation Cluster's (OSSA) 5th Ordinary General Meeting was held in Ankara on January 30, 2019 with broad participation. The activity report of the Board of Directors, operating income-expenditure accounts and reports of the supervisory board were released separately at the meeting. The budget was forecasted by assessing the activities for the years 2019-2020. The Ordinary General Meeting also witnessed the elections for the new term membership for the Board of Directors and Supervisory Board

President of the Defense Industries Prof. İsmail DEMİR, President of the Ankara Chamber of Commerce Gürsel BARAN, Vice Presidents of the Defense Industries Celal Sami TÜFEKÇİ, Mustafa Murat ŞEKER, Head of the Industrialization Department at the Presidency of Defense Industries Murat ÇİZGEL, Board Member at Aselsan Bayram GENÇCAN, SaSaD Secretary General Hüseyin BAYSAK, SaSaD Assistant Secretary General Yılmaz KÜÇÜKSEYHAN, TUSAŞ, Roketsan and many representatives of the government and private sector attended the general meeting.

Chairman of the Meeting, President of OSTİM's Board of Directors Orhan AYDIN, underlined the importance of the industry for our country as well as the role of the Presidency of Defense Industries (SSB). Stating that OSSA was formed under the leadership and guidance of the companies located at OSTİM with the know-how, support and contributions of the Presidency of Defense Industries in defense and aviation areas AYDIN added, "Although it is a novelty for us, the cluster philosophy offers a significant model that we correspond our history and geography with for the development of our country, our region and our industry in general."

Expressing that the cluster is an example of the philosophy of the Ahi - Order Orhan AYDIN remarked: "No matter how it is based on the western Porter theory, clusters are in fact a part of our history. Clusters enable



competition within the same industry as well as cooperation again within the same industry and have a background that allows self-improvement, self-development which guides the industrialists while keeping them in line. Therefore, we strive by fully believing in the cluster. OSSA is one of the first clusters we launched in OSTİM. In our zone, we also provide services

to other clusters regarding work and construction machinery, defense and aviation, medical supplies, energy, rubber, railed systems and communication technologies, etc. Taking a look at the times we passed, we are closely enjoying the benefits of the work we accomplished. Our Presidency of Defense Industries standing beside our cluster has a critical position as well. Their support and their approval of our work by saying 'Yes, we support this' is sufficient."

OSSA Chairman of the Board Mithat ERTUĞ stated that the cluster continues its activities without slowing down. Underlining that Turkey, who used to import almost everything related with the defense industries until the recent period, now entered the period of maturity, ERTUĞ added, "The size of the industry is well beyond US\$ 3.5 billion while the employment it creates is beyond 50 thousand. The industry has been offering



Mithat ERTUĞ -OSSA Chairman of the Board

critical opportunities and facilities to the SMEs. Thirty percent of the total defense industry turnover based on defense and aviation being accomplished by the subindustry composed mostly of SMEs is a clear indicator of the importance of the SMEs in this industry. OSSA was established to enable the access of the SMEs to such support, to have their voices heard and has acted as a bridge ever since.”

Mithat ERTUĞ noted that the International Cooperation Days in Defense and Aerospace remained at the top of the list of subjects that the cluster attached importance to and continued, “I believe this event plays a crucial role in our SMEs opening to foreign markets. This year, once again we successfully completed this event held every two years. We enjoy the justified proud of the fruitful event which turned out to be more successful than the previous one. According to the feedback we received, 2,200 people attended the event this year. Participation from 60 countries was observed, and 5,700 registered business negotiations were conducted. These figures are our source of pride. We aim each event to cast a shadow over the previous one, achieve more business negotiations, reach more SMEs and increase our exports. With a team at the background that has been working heartily for two years and with the support provided by the OSTİM Organized Industrial Zone and Presidency of Defense Industries, we overcame the obstacles ahead of us and made our mark on new achievements.”

President of the Ankara Chamber of Commerce (ATO) Gürsel BARAN pointed that the defense industry is one of the most crucial industries for the capital Ankara and for our country in general. BARAN said, “I know that defense industry has been creating a major added value for Ankara. Defense industry exports exceeded US\$ 2 billion. The 2017 figures of Ankara’s defense industry exports were US\$ 748



Gürsel BARAN - President of the Ankara Chamber of Commerce (ATO)

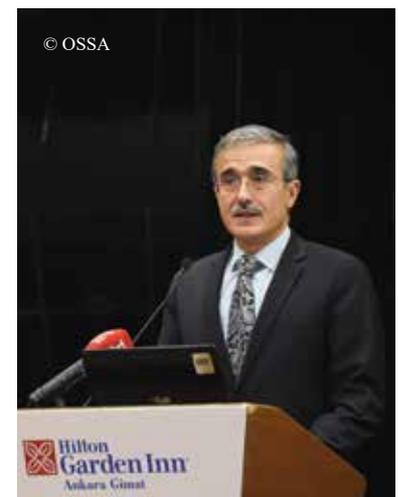
million. This figure increased to US\$ 969 million in 2018.”

In the course of his speech BARAN added, “While increasing its exports by US\$ 220 million, our capital Ankara accomplished the half of the overall exports of the industry alone. Therefore, Ankara proved that it was not only the capital of the government but also the capital of the defense industry. This point we reached pleases us while filling us with pride. Focus and momentum were given to the infrastructural activities for the production with indigenous technology especially in the last ten years. Within the scope of the efforts for indigenization, our defense industry has been manufacturing its own satellite, unmanned air vehicle, training jet, helicopter, infantry rifle, battleship, armored vehicles and missile and rocket systems. We have been conducting activities towards entering the top 10 countries in the world market in defense industry exports. The industry’s target set for the year 2023 is to reach the higher league in defense and aerospace industries and achieve exports of US\$ 25 billion.”

President of Defense Industries Prof. İsmail DEMİR underlined that OSSA established under the body of OSTİM went on building a model and added that from this point SAHA Cluster was founded in İstanbul. Prof. DEMİR said, “We wish these models

would be founded at other parts of Turkey as well and even turn into a more inclusive model including Ankara, because defense industry continues to attract the interest as a popular area. But we have to closely follow the necessary and sufficient conditions at this point in order to maintain a sustainable defense industry capable of gaining momentum and increasing its speed.”

In his speech Prof. DEMİR underlined the following points: “At the point OSSA arrived, as we also point in our visits from time to time, we particularly wish to underline the necessity of a change of the structure that cuts the metals well, or brings added value through labor processing the parts. We congratulate our companies processing the metal fine, yet as a change in dimension is vital, we wish that design, equipment, brainpower of the design and sweat of the mind could be added more at the processes. The second point is that we believe the workbenches processing the metals well should now be manufactured in our country. Another point is regarding the sub systems and parts which we underestimate dearly, we wish to avoid a series of foreign products related with the lenses, cables, detectors from various companies in our domestic products. Without doubt, we do not have many issues with



Prof. İsmail DEMİR - President of Defence Industries

the ordinary ones, but when we think of domestic products, we come across restrictions regarding supply nowadays. In a sense, we are in a nutshell pleased with this development as it creates awareness. No matter how frequently we mention the importance of indigenization, or warn to be cautious on sub components or how much effort we exert, our companies may have utilized them in a way, yet they seek for our help as soon as they hit the wall. At that point, we roll our sleeves reassuring these companies that we will be solving their problems. We mention the necessity of building companies one fourth, one fifth of the size of Aselsan. If our pyramid gets pointed, in other words if we have



3-5 companies reaching US\$ 1 billion, and if we lack companies of US\$ 300, 200, 100 million, then we consider this as a deficiency and we believe in the necessity of having such companies. Clusters such as OSSA should gather to have their voices heard, and by reflecting the cluster models to other parties, they should gather various companies and apply for the systems with a cooperation model and we expect them to perhaps enter the equality as main contractors in certain areas at this point, as ambitious players. As the Presidency of Defense Industries, we are executing various activities in order to support the industry and these activities will continue. Our hearts and eyes will follow you constantly. By gathering certain products and companies, by putting the industries, be it may be service industry, or the production industry that are pleased by their utilization into the forefront, rendering their



utilization by all players of the industry compulsory, enabling the facilities including both training and consultancy and the supply and utilization of the system including the moral and material support in terms of utilization, and extending them, by disengaging with a foreign - dependent institutional management system in Turkey, we wish Turkey to accomplish and develop its own institutional



management systems through indigenous resources and move onto a model which will be set as an example and used extensively in the world. We are ready to

provide support regarding this area. Our colleagues are more or less familiar with the model. We can conduct various activities by gathering and extending its usage.”

Following the speeches, the membership elections for the Board of Directors and Supervisory Board were held. According to the results of the elections, the new presidency term of OSSA will be composed of the following names:

- › Board of Directors (Permanent Members): Küçükpazarlı Havacılık/ Taha KÜÇÜKPAZARLI, EMGE/ Ahmet Mithat ERTUĞ, Hezarfen Havacılık/Emre FİDAN, Dora Makina/Bekir SAĞLAM YÜREK, Alkan Makine/Mehmet ALKAN, Öznur Makine/Durali EKİCİLER, UDEA/ İbrahim UĞURLU
- › Supervisory Board (Permanent Members): Tolga Plastik/Mehmet Hakan ATALAY, Metalurji Akdağ Isıl İşlem/ Harun OTACI, Arıtes/ Utku KARACA.



A Great Acquisition – BİTES is a New Subsidiary of Aselsan

Aselsan added BİTES Defence to its subsidiaries by acquiring a 51 percent stake in Ankara-based BİTES A.Ş., which operates in technology fields such as artificial intelligence, augmented reality, intelligent autonomous system software, deep learning, image and signal processing

Established in 2005, BİTES Aerospace & Defence Technologies is a national and high technology-oriented defence industry company with 100 professional experienced staff. In 2018, BİTES realized 49 percent of its net sales as exports. Internationally recognized as a supplier for global giants such as Lockheed Martin, Sikorsky, Airbus, and Hensholdt; BİTES continues its activities at the R&D Center at the METU Information & Innovation Center.

BİTES develops software-intensive systems in the fields Command & Control Software and Information Technologies for mission-critical systems within the Turkish Armed Forces, as well as Training/Simulation technologies for the requirements of the defence

& aerospace industries. In 2014 and 2017, BİTES was named one of the world's top 100 Simulation Technologies companies by "Military Training Technology" magazine, one of the leading Simulation and Training Industry publications in the United States. From 2014 to 2017, the Company remained among the 50 Fastest Growing Technology Companies in Turkey in the Deloitte Technology Fast 50 program. Receiving R&D Center award by Ankara Chamber of Industry in 2016, and İnovaLİG 2017 Outstanding Achievement Certificate in 2017, BİTES was also included in the Informatics 500 and TİM 500 lists. In 2018, the company was nominated by "Military Training Technology" magazine for the outstanding innovative product category with



its Augmented Reality-based Maintenance System product. Aselsan, in line with its sustainable growth target, has 10 partnerships in Turkey and 7 partnerships abroad with varying ratios. BİTES became the 11th subsidiary of Aselsan in Turkey. Aselsan continues to provide services with its offices in four countries as well as its partnerships in foreign countries.

Görkem BİLGİ Appointed as International Business Development Director at BMC Group

Görkem BİLGİ has been designated as the "International Business Development Director" at BMC Group.

Görkem BİLGİ, following his graduation from TED Ankara College, Baskent University in Political Science and International Relations, he completed his MBA degree at the University of California Riverside in the United States. During his professional career, he worked for Besiktas Football Club, TAV Airports Holding and Presidency of Defence Industries (SSB) in various business development and marketing roles and positions.

Görkem BİLGİ joined Turkish Aerospace Industries (TAI) and

worked for 10 years as a Helicopter Business Development Manager and Corporate Marketing Manager. During his assignment with Turkish Aerospace Industries (TUSAŞ), he held a major key role on significant export stories of Turkish Aerospace, such as; Pakistan T129 ATAK Helicopter Export which is the Turkish Defence Industry's biggest export success story to date.

As of February 1st, 2019, Görkem BİLGİ has been working as the International Business Development Director for defence products of BMC Group. With this assignment, Mr. Bilgi assumes a critical leading role to create and establish new global business



Görkem BİLGİ- International Business Development Director at BMC Group

opportunities regarding near future strategies of BMC Group to become a global competitive power.

Defense Industry Helicopter Platforms are Trusted with Domestic and National Experts

Türk Loydu and HeliPlat have signed an important cooperation agreement for our defense industry. A cooperation protocol on tests and controls to meet the helicopter platform certification / licensing requirements was signed between Türk Loydu and HeliPlat at a ceremony held at the headquarters of Türk Loydu. Türk Loydu stands out with its support to the Turkish ship industry and continues to make a name for itself with its support to national supplier companies within the scope of the indigenization move in our defense industry

The protocol will document the conformity of the platforms by providing supervision of Türk Loydu to the tests within the scope of the helicopter platform (heliport, helideck) certificate / licensing requirements to be carried out by HeliPlat experts in Turkey and abroad. In this way, all helicopter platforms to be used in the defense industry will be able to obtain the conformity documents without being foreign-dependent.

Türk Loydu Foundation President Cem MELİKOĞLU, General Manager of Türk Loydu Conformity Assessment Services, Lütfü SAVAŞKAN and Türk Loydu executives together with HeliPlat General Manager Fuat AKPINAR, Administrative Affairs Manager Mehmet ERCAN and HeliPlat employees attended the cooperation protocol signature ceremony on 17 January 2019.

At the ceremony, after the presentation regarding the process manufacturing and licensing of all helicopter platforms to be made within the scope of civil aviation, especially in the defense industry, as well



as regarding the consultancy that they have provided for this process, HeliPlat General Manager Fuat AKPINAR noted the following words: "In order to produce and use domestic and national products in all fields in line with our country's target, HELİPLAT and Türk Loydu have signed a strong cooperation agreement in order to indigenize and test the Helicopter Platform certification materials together. In the field of Civil Aviation, especially in the Defense Industry, this agreement has been an important step for our country and for us to eliminate foreign dependency. It will be our greatest goal to guide the Middle East and Turkic Republics in this regard while eliminating the foreign

dependence of our country in this area."

Relaying information also on the founding purpose of HeliPLAT, Fuat AKPINAR said, "HeliPLAT Ltd. Şti. was established with 100% domestic capital on 11 March 2016 in the Tuzla/Istanbul region in order to become a solution partner in the certification / licensing process



of Helicopter Platforms with its General Manager, who is a Helicopter Trainer certification inspector and has served in the Naval Forces Command for more than 25 years, as well as with its experienced personnel. During this period, it has been our greatest goal to provide all kinds of consulting services to the certification / licensing processes of helicopter platforms with professional solutions starting from the design stage in the military platform projects both in the country and abroad, the projects of the Presidency of Defense Industries being in the first place, and within the scope of the General Directorate of Civil Aviation projects, to execute tests appropriate to the national and international standards in this process and to create safe helicopter landing areas (heliport / helideck) by providing appropriate training.”

Türk Loydu Foundation Chairman Cem MELİKOĞLU touched upon the importance of the indigenization moves in recent years in Turkey and the activities carried out in accordance with international standards especially in military areas, and he stated that the national institutions have increased their know-how and experience and developed the sectors to which they belong by this accumulation in a way to eliminate foreign dependency. Cem MELİKOĞLU also stated that HeliPlat recently carried out helicopter platform certification and training activities on the Türk Loydu Class Submarine Rescue Mother Ship (MOSHIP), Rescue and Towing Ship (KURYED), Seismic Research Vessel and Amphibious Ships, and there are fully domestic and national expert organizations that can provide high quality services in these areas.



Suppliers Gathered at Otokar Facilities



Otokar met with its approved suppliers in a meeting held at Otokar facilities in Sakarya on 31st January. An evaluation of the previous year and expectations for 2019 were shared with participants and achievement plaques were presented in areas of Collaboration and Performance. Following the meeting, suppliers representing 21 companies visited the production facilities and test center of Otokar in Sakarya factory, which is located on an area of 552 thousand square meters.

Otokar, one of the major automotive companies in Turkey, met with high-performing suppliers to review a very successful year end 2018. Suppliers were invited regarding their performance in areas such as “timely supply”, “cost”, “cooperation”, “quick reaction”, “quality” and “business volume.” Association and Performance Plaques were presented to the participants.

In the meeting where Otokar and the automotive market were evaluated, the company’s 2019 goals and expectations for the upcoming period were shared. Otokar Assistant General Manager Ali Rıza ALPTEKİN

stated that Otokar successfully completed 2018 despite the economic conditions and the contraction in the market and thanked all suppliers: “We have made significant deliveries all around Turkey. We became the most preferred bus brand of Turkey for the 10th time in the segments in which we operate. Last year we accelerated our export activities and we won major bus tenders in Europe and made deliveries. In the field of the defence industry, we are moving rapidly toward becoming a global brand by starting to export technology. We consider our suppliers to be the most important business partners in achieving success. We would like to thank all of our suppliers who supported us with details such as common product development and on-time delivery by creating joint strategies in the commercial vehicle and defense industry.” ALPTEKİN stated that they aim to have a good year in 2019 as well with accurate and timely deliveries, competitive prices and the support of Otokar suppliers.

After the meeting, the suppliers visited the production facilities and test center of Otokar at the Sakarya factory.

Aselsan Team up with Şişecam Group for Developing Glass and Glass Ceramic Materials

Şişecam Group, a global player in all key areas of glass, and Aselsan Turkey's largest defense electronics provider, will work together to develop joint projects. Within the scope of the cooperation, Aselsan aims to develop domestic and national solutions for product composition and optimization in addition to supplying materials at standards to be used in defense industry projects

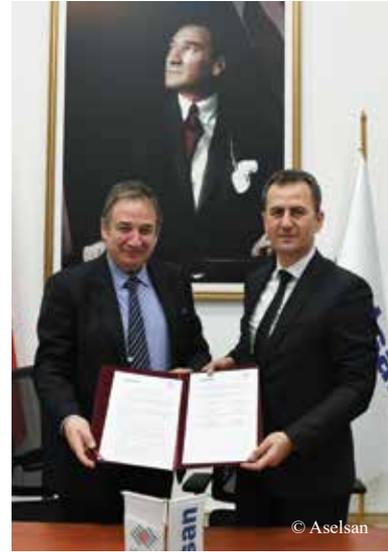
Aselsan and Şişecam Group have signed a cooperation protocol in order to provide solutions for the products to be used in Aselsan's defence industry-focused projects as well as product composition and optimization. Under the signed protocol, Şişecam Group and Aselsan will work together with the aim of producing unique solutions by combining their opportunities, capabilities, and experience from their deep-rooted history.

Aselsan Chairman & CEO Prof. Dr. Haluk GÖRGÜN, Aselsan Corporate Management Vice President Doç. Dr. Hakan KARATAŞ, Şişecam Group Vice Chairman & CEO Prof. Dr. Ahmet KIRMAN and Şişecam Group Chief Research Technological Development Officer Prof. Dr. Şener OKTİK attended the signing ceremony of the cooperation protocol at Aselsan Macunköy facilities with the aim of laying the foundation for future collaboration and cooperation.

Emphasizing that they continue to create value for Turkey, Şişecam Group Vice Chairman & CEO Prof. Dr. Ahmet KIRMAN stated the following in his speech at the ceremony: "Founded in 1935 with the mission of establishing and developing the glass industry in our country, Şişecam Group became a leader in its field in the world over the past 80 years and has continued to create value for our country at every stage of its deep-rooted history. Today, our Group, carrying out its production activities with 43 facilities in 13 countries on three continents, is the third largest manufacturer of glassware and the fifth largest manufacturer of glass packaging

and flat glass in the world. In addition to being one of the 10 largest soda producers in the world, we are the world leader in chromium chemicals. I think of our cooperation agreement with Aselsan, which has become a company on an international scale by expanding its activities and having started in 1975 in order to cater to the national and unique communication requirements of the Turkish Armed Forces, is very meaningful in this respect. I believe that these two reputable organizations will undertake important projects together thanks to their knowledge and experience in their fields of activity."

Aselsan Chairman & CEO Prof. Dr. Haluk GÖRGÜN, in his speech at the ceremony, said the following: "Our priority is to meet the requirements of our country in the field of defense with indigenous solutions. Aselsan currently has more than 400 projects being carried out simultaneously. Some of those are major projects known to the public, and some are special projects that merely were launched regarding the requirements of our security forces. We aspire to make the most out of any ability, developed, or to be developed, domestically. We have significant engineering capability. We produce a variety of products and systems from military systems to civilian systems. Almost all of the toll collection systems on the highways, apart from that the power systems for renewable energy systems in the energy sector, are produce by Aselsan. In addition, we are currently working on manufacturing X-ray and MRI devices for the health



sector. We pay special attention to cooperating with all companies that will work and produce with us in these sectors."

Within the scope of the cooperation the goal is to develop a wide range of glass and glass-ceramic materials for use in various equipment to be developed by Aselsan, particularly the periscope glasses of our national Main Battle Tank. The cooperation is to be carried out in two phases consisting of preliminary studies and the production of prototypes and will be valid for at least two years. Compared to conventional glass, these materials are expected to have thermal shock resistance, high durability, and unique optical performance according to the specs of the equipment to be applied. The compositions of these products to be used by Aselsan is aimed to be developed and produced by Şişecam indigenously at all stages starting from the point of raw material.



SİVİL HAVACILIKTA

Toplumsal Cinsiyet Dengesi

Toplumsal Cinsiyet Dengesi Geliştirme Komisyonu



Let Women Soar! Efforts to Develop Gender Equality in Civil Aviation

Doç.Dr. Ferhan KUYUCAK ŞENGÜR - Eskişehir Technical University Faculty of Aeronautics and Astronautics, Associate Professor of Aviation Management and Strategy

Biological Sex one of the characteristics that each individual comes with when they born into this world: We are born as girls or boys. Our biological gender characteristics, as biological attributes, are one of the first determinants of us. This is our biological gender. Then, what is Gender? As a matter of fact, aside from these fundamental biological differences, we are born into this world as babies that are not very different from each other, however, the society we live in “raises” us as “girls” or “boys”. We “learn” how to be women or men with these patterns. Society, our family and individuals have different expectations from us as men and women, and we are expected to act accordingly to this difference. In other words, when we talk about gender, the socio-cultural origins of women and men concepts are taken into consideration instead of biological and innate differences in the creation of these concepts. While biological gender is an innate characteristic, social gender is a social and cultural construct.

Basically, gender only differentiates us from each other, just like biological gender. In this context, gender is not supposed to be a problem for equal individuals who have different roles and responsibilities. The problem here is not the difference, but when this difference creates the basis for discrimination. Generally, we see that the distribution of possibilities, opportunities, and resources in society is distributed mainly based on gender indicators rather than individual differences. And this distribution causes large-scale inequality for women. Aksu Bora from Ankara University Faculty of Communication Women's Studies Center (KASAUM) summarizes this issue in her Gender Guidelines prepared for NGOs:

“The patterns of femininity and



masculinity not only differentiate us from each other but also greatly affect our access to social resources. In short, gender is an essential factor in the distribution of resources. We see the effect of this factor clearly in the figures.”

The gender imbalance against women is a phenomenon that has been going on for centuries. Not only women's work and contributions to the economy are not reflected in official figures, but also the wages of women participated in various fields of labor are lower than the men who do the same job. According to the calculations made by the World Economic Forum (WEF) based on economical, health, educational and political indicators, if the current conditions continue in the same way, the equality of men and women in the world can only be achieved after 217 years. This survey conducted among 144 countries reveals the extent of the gender inequality gap in employment and wage.

When we talk about gender and gender relations, we often think of women and “women's issues”. As

Bora says: “This is understandable because comprehending gender as a social and political phenomenon only became possible after the long struggles of women. When women, who demanded political and social rights, exposed gender-based discrimination in a clear and powerful manner that cannot be ignored, they also showed how social, economic and political relations could be perceived as gender relations at the same time... However, not only gender relations entirely consist of “women's problems”, but also those perceived as “women's problems” are not exclusively women's problems.”

We can fight against social discrimination between genders only through cultural change. The United Nations defines the concept of “Gender Equality” as accessing equal rights, responsibilities and opportunities between women and men, girls and boys. What is actually meant by Gender Equality is equal possibilities for accessing those rights rather than pure numerical equality. Therefore, it would be more

meaningful to talk about a “Gender Balance”. The aim of gender studies is to achieve a social order that will maximize our benefits as a society in employment, social and cultural life by benefiting from the advantageous and disadvantaged aspects that women and men bring biologically.

Aviation is one of the technology-intensive, international and team-based safety-critical industries. It is also seen that women assumed major roles in aviation from the very beginning. When we look at world and Turkish history, we see that female aviators are quite active in aviation compared to other fields. However, the gender imbalance we mentioned above is an undeniable fact in aviation as well. Developing gender balance in a global industry with such a high impact on economic and social life is also a vital necessity.

There are very positive developments in our country in order to improve this balance. The Directorate General of Civil Aviation (DGCA), published the Instruction on Development of Gender Balance in Civil Aviation (SHT-TCD) in 2018 in order to ensure gender balance among employees in the civil aviation sector, to provide equality of opportunity for the genders in the selection of aviation professions and to encourage women to participate in education and training in aviation-related areas. Following this, the Gender Balance Fostering Commission (GBFC) was established under The Directorate General of Civil Aviation. The “**Gender Balance Fostering Commission (GBFC)**” has been established in the Turkish civil aviation sector; in order to oversee and develop recommendations to improve gender balance, work towards the creation of equality of opportunity for the genders in the selection of aviation professions, and especially encourage women to participate in education and training in aviation-related areas.

The first and most comprehensive event in this field, a symposium on “Development of Gender Balance in Aviation” was organized by DGCA on March 8, 2018, in Ankara. The symposium organized by the Gender Balance Fostering Commission (GBFC) of the DGCA for the “Women of Aviation Worldwide

Week” and “March 8, International Women’s Day” was held under the motto of “Let Women Soar!” with the participation of women aviators who works in the aviation sector. March 8th is recognized/celebrated as International Women’s Day around the world. In addition, for the first time in the world a woman, Baroness Raymonde De Laroche, obtained a pilot license on March 8, 1910. Consequently, March 8 is also important in aviation and celebrated by the Institute for Women of Aviation Worldwide (IWOAW). Therefore, in the first meeting of DGCA - GBFC, it was decided that the entire week of March (from Monday to Sunday), which includes 8 March, was recognized as “Women of Aviation Worldwide Week” in Turkish Civil Aviation as it coincides with Women of Aviation Day on March 8th. It was decided to schedule the planned activities throughout this week thus the efficiency of the events will not decrease. Moreover, the theme of the GBFC activities in 2019, was determined as “Let Women Soar - Women in Airport” considering the largest aviation project of this year in Turkey is the Istanbul New Airport project. In 2019, the week of March 4-10 will be celebrated as Women of Aviation Worldwide Week.

With the approval of the DGCA - GBFC, activities in aviation with the “Gender” theme continue to be organized. On April 26, 2018, a symposium themed “Women in Air & Space” was organized under the Eurasia Airshow 2018 in Antalya.

While we achieve promising results in the development of gender balance in aviation in our country, the ICAO has also begun to place special emphasis on gender issues. On 08 - 10 August 2018, the 1st Global Aviation Gender Summit was held in Cape Town, South Africa with the support of UNESCO. GBFC secretary Gonca KÜRÜM represented the GBFC and Turkish civil aviation organizations at this summit and made a presentation on the activities of our country. This presentation attracted quite an amount of attention and portrayed our efforts and experiences as a guide to other countries. The Summit, which will be held for the second time this year, is extremely

valuable in terms of globalization of efforts related to Gender in Aviation.

The DGCA - GBFC, which I am a member of, continues its activities and we have recently held our second meeting with the participation of our Advisory Board members, hosted in Istanbul by TAV Airports Holding. Our Commission and Advisory Board consists of all valuable senior executives from our aviation industry. We believe that this initiative will expand further with the contributions that will increase in the following years. We would also like to honor the efforts of the Deputy Director General of the DGCA, Mr. Can EREL, our Chairman of the Commission, who has been working for the Development of Gender Balance as well as the establishment of our Commission and we express our gratitude as women aviators.

According to the WEF report, although gender inequality decreased in 82 countries compared to last year, it is increasing in 60 countries. Unfortunately, Turkey is one of the countries with increased inequality. Our country, which ranked 130th in gender inequality last year, fell to the 131st place this year. Unmistakably, we should do something about it, we must do something! Aviation is a field that allows extensive female employment compared to many industries. The steps to be taken towards developing gender balance in this field can also have a tremendous impact on transforming our society.

Let’s work together on this! As we said, this is not a women’s problem this is a problem for all of us. Essentially, there is no “woman aviator” it is “aviator”! We will achieve real equality and equilibrium when we do not need to mention this.

You can access studies about the DGCA - GBFC at the following address:

<http://web.shgm.gov.tr/tr/shgm-calisma-gruplari/5771-sivil-havacilik-genel-mudurlugutoplumsal-cinsiyet-dengesi-gelistirme-komisyonu>

You can also contact our Commission at the following e-mail address:

DGCA - GBFC shgm-tcdgk@shgm.gov.tr

Directorate General of Civil Aviation- Development of Gender Balance Initiative

It is essential that the civil aviation sector is structured in accordance with international aviation safety and security standards, and aviation activities are conducted and supervised with respect to these rules. The Directorate General of Civil Aviation (DGCA) is the authority that determines and supervises the implementation of the rules in the civil aviation sector in Turkey. The DGCA communicated a directive on "Instruction on Development of Gender Balance in Civil Aviation" on February 28, 2018, and subsequent events and activities are to be held in order to improve gender balance in civil aviation and to ensure equality of opportunity in the selection of aviation professions. Of key importance is taking into consideration the efficient use of institutional and sectoral capacity and improving service quality in maintaining aviation activities in accordance with the principles set forth.

Within the scope of this directive, which sets out the principles and procedures relating to the work and activities required to improve gender balance in the Turkish civil aviation sector; the "Gender Balance Fostering Commission (GBFC)" has been established in order to oversee gender balance in the civil aviation sector and to develop recommendations to improve it, work towards the creation of equality of gender opportunity in the selection of aviation professions, and especially encourage women to participate in education and training in aviation-related areas.

A Temporary Commission was established on March 01, 2018 in order to plan and implement the first activities and as part of the Women of Aviation Worldwide (WOAW) Week under the motto "Let Women Soar!" A symposium with the theme "Development of Gender Balance in Civil Aviation" was organized in order to raise awareness on gender equality by increasing the number and status of women in aviation.

The Commission, aimed to be the

first in the world in its field; attracted the attention of the "International Civil Aviation Organization (ICAO)", a UN specialized agency established to ensure the steady development of international civil aviation and the implementation of civil aviation rules on a global level, and was invited to the "ICAO Global Aviation Gender Summit", organized for the first time in 2018, to share its experiences. At the Summit held on 08-10 August 2018 in Cape Town, South Africa, within the scope of "Gender Equality" which ranks fifth among the ICAO's Strategic Goals, closely linked to the 15th United Nations Sustainable Development Goals (SDGs); the efforts towards ensuring gender balance in Turkish civil aviation were voiced and this initiative, which was carried out under the responsibility of the civil aviation authority, received attention and appreciation on a global scale.

The first DGCA - GBFC started its activities on April 09, 2018. The Commission consists of a total of 8 permanent and 2 substitute members including 4 permanent and 1 substitute members representing the DGCA and 4 permanent and 1 substitute members representing the private sector. Excluding the Commission, which meets once every three months (Quarterly); there is also an Advisory Board selected from among the representatives of aviation authorities and the sector, determined by the decision of the GBFC to participate in these meetings, in order to contribute to the activities of the Commission and to ensure that the assessments and activities to be carried out are heard on a larger scale. Activities related to the development of gender equality in Turkish civil aviation are also carried out by sub-groups consisting of Commission and Advisory Board members, including representatives from DHMİ, Eskişehir Technical University, the Istanbul Bar Association, Turkish Airlines, Pegasus, İGA, TAV Airports Holding, HAVAŞ, Çelebi, APS Aviation, and Kaan Aviation in addition to the

DGCA. Currently, the said activities are carried out by a total of three sub-working groups, namely the Situation Assessment Sub-Working Group, the Communication Sub-Working Group, and the Road Map & Incentives Sub-Working Group.

In the Turkish civil aviation sector, the Commission by the provisions of DGCA - GBFC Instruction, organizes activities within the year in order to contribute to gender balance and conducts activities. The theme for this year is to be determined at the "Women of Aviation Worldwide (WOAW) Week", which is held the 8th day of March every year. A symposium with the theme of "Women in Air & Space" was held in Antalya on April 26, 2018, in addition to the first activities of the Commission, the Development of Gender Balance in Civil Aviation Symposium held in Ankara and also the First ICAO Global Aviation Gender Summit.

Apart from the mentioned activities, another Commission activity is that of awarding the "Registry of First Aviatrix" certificate. The Commission, in accordance with the purpose of DGCA Instruction, conducts a registry study in order to ensure national and international recognition of the first or leading women, who flew or contributed to the flight of an aircraft, significantly contributed to the development of aviation, pioneered and raised awareness in the subject.

You can visit <http://web.shgm.gov.tr/tr/s/5771-sivil-havacilik-genel-mudurlugu-toplumsal-cinsiyet-dengesi-gelistirme-komisyonu> to get detailed information about the activities carried out by the Commission and to follow current developments. To contact the Commission, you can send an e-mail to shgm-tcdgk@shgm.gov.tr

ICAO and the United Nations Sustainable Development Goals (<https://www.icao.int/about-icao/aviation-development/Pages/SDG.aspx>)



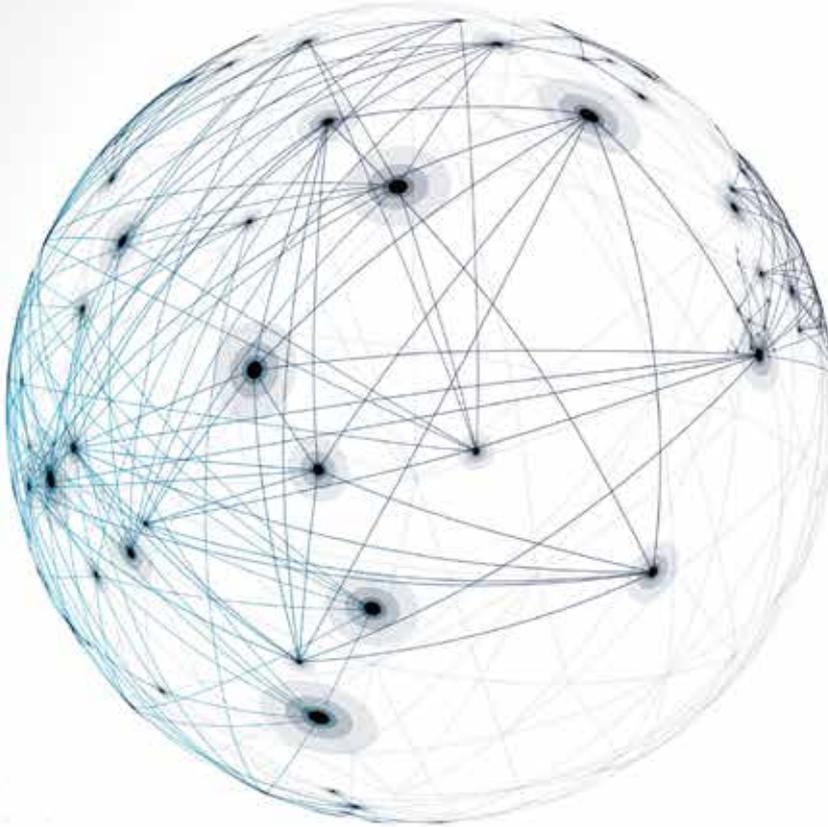
8. ULUSAL SAVUNMA UYGULAMALARI MODELLEME VE SİMÜLASYON KONFERANSI

Büyük Veri Çağında Modelleme ve Simülasyon

19-21 Kasım 2019
ODTÜ Kültür ve Kongre Merkezi,
Ankara

KONULAR:

MODSİM Altyapı ve Teknolojileri
Eğitim, Öğretim ve Tatbikat
Analiz ve Karar Destek
Mühendislik, Ar-Ge ve Test
MODSİM Uygulama Alanları



Önemli Tarihler:

Bildiri Özeti İletimi için Son Tarih: 14 Nisan 2019

Tam Bildiri İletimi için Son Tarih: 15 Mayıs 2019

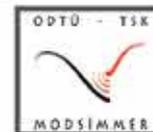
Konferans Son Kayıt Tarihi: 11 Kasım 2019

usmos@metu.edu.tr

usmos.metu.edu.tr



SaSaD



Utku ALANÇ Appointed General Manager of ARES Shipyard

ARES Shipyard announced that Utku ALANÇ was appointed General Manager as of January 2019 within the scope of the institutional structuring and reorganization studies. He has served as the Deputy General Manager at ARES Shipyard since April 2016

Utku ALANÇ has managerial experience in Business Development, Integrated Logistics Support (ILS) and Contract Management. He started his professional career in 2001 as an officer in the Turkish Navy, and has participated in many shipbuilding and supply projects such as assault boats, submarines, mine-hunting ships and, finally, MILGEM class corvettes. In 2014, he joined ARES Shipyard as ILS and Configuration Director. He was appointed as Deputy General Manager responsible for Business Development, Sales/Marketing, ILS and Information Technologies in 2016 following international maintenance contracts and service sales programs during his two-year ILS and Configuration Directorate.

Holding a BSc degree in Electrical and Electronics Engineering and an MSc degree in Contract Management, ALANÇ recently completed the London Business

School Senior Executive Program.

Speaking on his appointment, Utku ALANÇ said, "ARES is Turkey's biggest exporter of ships and the fastest growing company. It is a pioneer and an innovative shipyard in the international arena. I have had the opportunity to work with an outstanding team for five years since joining ARES. In this period, we have accomplished great undertakings in less time considering the long schedules of shipbuilding projects. In the coming period, we will continue to equip ARES with the highest production technologies and the most creative, determined, dynamic team by moving our products to new continents where our friends and allies are engaged and by accelerating our infrastructure and personnel investment programs that we have initiated to this end."

ALANÇ will report directly to the ARES Board of Directors during



Utku ALANÇ - ARES General Manager

his term. Kerim KALAFATOĞLU, Chairman of the Board of Directors said, "We are delighted to see Utku ALANÇ as our General Manager. With his experience and diligence, he has taken an important role to continue ARES' success throughout the world."

Management Change at Meteksan Defence

As of 01.02.2019, Selçuk Kerem ALPARSLAN was appointed as the President of Meteksan Defence. He was previously the Deputy President of Radar Systems at Meteksan Defence

In the written statement made by Meteksan Defence, it was stated that Selçuk Kerem ALPARSLAN was appointed as the President of Meteksan Defence as of 01.02.2019 and noted that he was previously the Deputy President of Radar Systems.

Born in Ankara in 1969, Selçuk Kerem ALPARSLAN has BS and MS degrees in Electrical and Electronics Engineering from Middle East Technical University, as well as an Executive MBA degree from the Faculty of Business Administration at Bilkent University. Between the years of 1991-2005, he worked at Aselsan Inc. in the fields of design-development engineering and technical management. Afterwards, between 2005 and 2007, he worked as the System Application Director at

the R&D branch of US Synplicity Inc. in Turkey that has been performing activities the field of Electronic Design Automation. Selçuk Kerem ALPARSLAN then started working as the Engineering Director at Meteksan Defence. He was the Deputy President in charge of Engineering in 2009, Deputy President in charge of Sensory Systems in 2013. In 2016, he was assigned as the Deputy President of System and Product Engineering.

Tunç BATUM, who had been the President of Meteksan Defence since 2016 made Meteksan Defence a successful company in the international market in its fields of activity, increasing his credibility and business volume in the defence industry sector. He left his position as President on 01.02.2019, he was



Selçuk Kerem ALPARSLAN - General Manager of Meteksan Defence

appointed as Bilkent Holding Group President and Meteksan Defence Board Member.

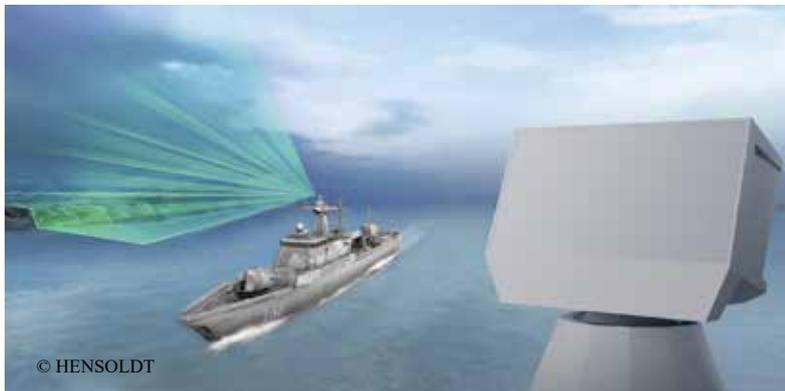
HENSOLDT to Supply Naval Radar for German Corvettes

TRS-4D guarantees best possible detection in difficult coastal waters

HENSOLDT, the leading independent sensor house, will equip the second batch of the German Navy's K130 corvettes with its TRS-4D Rotator naval radar and its MSSR 2000 ID friend-or-foe identification system (IFF). The company was awarded a corresponding order for seven systems of each type from the German procurement authority BAANBw, which are to be delivered by 2022.

"With the TRS-4D, the corvettes will be given an extremely powerful radar system which has already proven its capabilities, especially in the difficult environment of coastal waters," said HENSOLDT CEO Thomas Müller.

The TRS-4D is already being used on board the new F125 frigate, in a configuration comprising four fixed planar arrays. Moreover, HENSOLDT has previously equipped the first K130 batch with its TRS-3D radar. For the second batch of five ships, the TRS-4D has now been ordered to be supplied in a version comprising a mechanically rotating antenna (TRS-4D Rotator), which, for example, is also under contract for the U.S. Navy's littoral combat ship (LCS). This radar system is part of a family of products which also include a ground-based air defence radar, TRML-4D, and thus benefits from continuous product improvements and advantages



with regards to spare part management and training.

The TRS-4D has been designed to be used for anti-aircraft and anti-surface operations. Its rotating antenna combines mechanical and electronic azimuth scanning, which allows targets to be detected and tracked very quickly. Thanks to the increased sensitivity of the radar system's AESA technology it is possible to detect small

and manoeuvring targets more precisely and to confirm the targets more quickly, which means that the ship crew has more time to respond to threats. As the system's characteristics can be defined via its software, the radar can be specifically programmed and its parameters set according to the customer's requirements and can also be adapted to any new or modified threats that may arise over the useful life of the ship.

The system also includes an MSSR 2000 I secondary radar for friend-or-foe identification (IFF), which complies with all IFF standards, even the latest "Mode S / Mode 5". At present, all NATO troops and their allies are in the process of converting their IFF systems to Mode 5 as this standard is required for joint operations with NATO and other allied forces.



Aselsan Organizational Change

The Aselsan Board of Directors decided to appoint Board Member Bayram GENÇCAN as the Communication and Information Technologies (CIT) Sector Chairman and Deputy General Manager as of February 5, 2019 after Yavuz BAYIZ's retirement. GENÇCAN will also continue to serve as a member of the Board of Directors. The other

hand, the Business Development and Marketing Department was structured to be the Directorate. Business Development and Marketing Director Osman Devrim FİDANCI was appointed as the Deputy General Manager as of February 1, 2019.

In the statement made by Aselsan, the following was recorded: "In order to support

our strategy on export-oriented growth, which is one of the most important elements of our company's organic growth potential, and to compete more effectively with global players, it has been decided that the Business Development and Marketing Department is to be structured as a Directorate."

Airbus and Dassault Aviation have Signed a Definitive Agreement to the Joint Concept Study Contract for Future Combat Air System

Joint Concept Study (JCS) based on High Level Common Operational Requirements Document (HLCORD) have signed in 2018 by France and Germany. Follows landmark agreement between Dassault Aviation and Airbus Defence and Space in 2018 to develop and produce Future Combat Air System

France and Germany have awarded the first-ever contract – a Joint Concept Study (JCS) – to Dassault Aviation and Airbus for the Future Combat Air System (FCAS) program. The launch of the JCS was announced by the French Minister of the Armed Forces, Florence PARLY and her German counterpart, Ursula von der LEYEN, at a meeting in Paris on 6th February. The decision by both countries represents a milestone to secure European sovereignty and technological leadership in the military aviation sector for the coming decades. Starting date for the two-year study is 20 February 2019.

Eric TRAPPIER, Chairman and CEO of Dassault Aviation said: “This new step is the cornerstone to ensure tomorrow’s European strategic autonomy. We, as Dassault Aviation, will mobilize our competencies as System Architect and Integrator, to meet the requirements of the Nations and to keep our continent as a world-class leader in the crucial field of Air Combat Systems.”

Dirk Hoke, CEO of Airbus Defence and Space, said: “FCAS is one of the most ambitious European defence programs of the century. With today’s contract signature, we are finally setting this high-technology program fully in motion. Both companies are committed to providing the best solutions to our Nations with regard to the New Generation Fighter as well as the systems of systems accompanying it. We are truly excited about having been given this opportunity and



appreciate the trust placed in both our companies.”

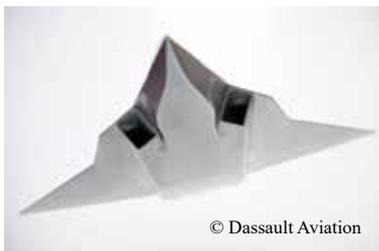
This planned Next Generation Weapons System will consist of a highly capable manned “New Generation Fighter” (NGF) teaming with a set of new and upgraded weapons as well as a set of unmanned systems (Remote Carriers) linked by a Combat Cloud and its Ecosystem embedded in a System-of-Systems FCAS architecture.

FCAS defines a system of systems combining a wide range of elements connected and operating together, including a next generation fighter aircraft together with Medium-Altitude Long-Endurance Unmanned

Aerial Vehicles (UAVs), the existing fleet of aircraft (which will still operate beyond 2040), future cruise missiles and drones flying in swarms. The overall system will be interoperable and connected in a larger perimeter with mission aircraft, satellites, NATO systems and land and naval combat systems.

The JCS is based on the bi-nationally agreed High Level Common Operational Requirements Document (HLCORD) signed at Berlin Air Show ILA in April 2018 between the Defence Ministers of France and Germany as well as respective national concept studies. Its aim is to conceptualize the different FCAS capabilities and to pave the way for future design, industrialization, as well as an estimated full operational capability by 2040.

The study will prepare and initiate demonstrator programs for launch at the Paris Air Show in June 2019.



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GE Aviation's T901 Selected by U.S. Army to Continue Powering Black Hawk, Apache Helicopters

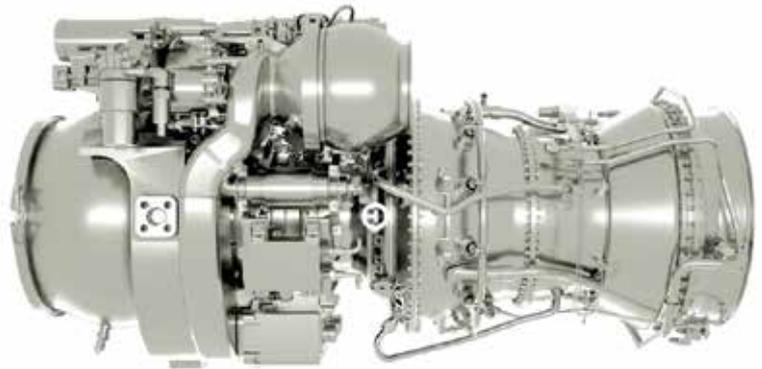
The U.S. Army has selected GE Aviation's T901-GE-900 Engine for the Engineering and Manufacturing Development (EMD) phase of the Improved Turbine Engine Program (ITEP), the U.S. Army's endeavor to re-engine its Sikorsky UH-60 Black Hawks and Boeing AH-64 Apaches.

"We are honored to be chosen by the Army to continue powering their Black Hawks and Apaches for decades to come," said Tony Mathis, president and CEO of GE Aviation's military business. "We've invested in the resources and infrastructure to execute immediately, and our team is ready to get to work on delivering the improved capabilities of the T901 to the Warfighter."

The T901 incorporates many proven technologies that will advance Army Aviation into the future of vertical lift. GE uses additive manufacturing to create advanced, cost effective parts with shorter development time that reduce fuel burn, decrease weight and increase durability. GE also uses ceramic matrix composite (CMC) components in the T901, which are lighter and more durable than metal parts and can withstand higher temperatures. GE's technology stack also includes 3D aerodynamic design tools, advanced cooling technologies and sand tolerant technologies. GE has spent decades developing and maturing these technologies in its commercial and military engines businesses.

The T901's single-spool core design, carried over from the T700, is the key to its low cost, growth, reliability, maintainability and reduced life-cycle costs.

GE Aviation and the US Army successfully installed a



© GE Aviation

full-scale T901 engine mockup into an Apache and Black Hawk in December of 2017, demonstrating that the T901 seamlessly integrates with both airframes. GE's experience in powering these aircraft missions with the T700 engine over the past four decades has informed its development of the T901

GE Aviation's Lynn facility delivered its inaugural production T700 turboshaft engine for the Sikorsky H-60 Black Hawk in March of 1978, marked by a ceremony that included then Army Black Hawk Program Manager COL Richard Kenyon who challenged the GE team to "be responsive to the pilots, crew chiefs and mechanics."

GE has embraced that challenge, continuously incorporating new technology and materials to enhance T700 reliability and performance and reduce its cost. Today, more than 4,000 Black Hawks of all types are in service, providing vital military and commercial aviation support to the U.S. and 30 other countries around the

world.

Now, GE stands ready to take the Black Hawk, Apache, and the U.S. Army into the future of rotorcraft aviation on another successful 40-year ride with its next-generation turboshaft.

"The T700's 40-year track record as the highly reliable, single-spool workhorse powerplant for Army Aviation is indisputable," said Ron Hutter, executive director of the T901 program. "We are proud of our heritage, we have invested for the future and we're ready to go."

GE has invested US\$ 9 billion in maturing technologies applicable to the T901 and more than US\$ 300 million to develop and test turboshaft-specific technologies. Additionally, GE has invested more than US\$10 billion in their supply chain over the past decade, including eight new facilities, ten plant expansions and one-and-a-half million square feet of new, advanced manufacturing space in the U.S.

Leonardo Signs Deal Worth Around €180M to Upgrade NATO's Electronic Warfare Training Equipment

Leonardo will deliver a range of new equipment to NATO JEWCS, the Alliance agency which supports armed forces training to face hostile electro-magnetic conditions. The equipment will cover air, land and maritime domains and also includes a capability for training crews to defend against anti-ship missiles. Leonardo's range of contracts in support of NATO signal a leadership position in a number of areas. This leadership position is driving sustainable growth, as laid out in the Company's 2018-2022 Industrial Plan

Leonardo has signed a contract worth approximately €180M to provide new electronic warfare training equipment for the NATO Joint Electronic Warfare Core Staff (JEWCS). Leonardo was selected in an international competition and will incorporate technology from partners Cobham and Elettronica.

The contract was placed by the UK Ministry of Defence as the host nation for NATO JEWCS, which is based at the Royal Naval Air Station (RNAS) in Yeovilton. Equipment will be delivered in tranches over the next 4 years from Leonardo's Electronic Warfare (EW) center of excellence in Luton, UK.

NATO JEWCS is the Alliance agency responsible for the high-tech world of electronic warfare. When NATO forces go on operations, they can expect the enemy to try and disrupt their radars, GPS and communications. Therefore, to train realistically, it is important that NATO Forces experience these effects and practice how to counter them. Part of NATO JEWCS's remit is to improve armed forces training by simulating the effects of an enemy's latest electronic warfare equipment during exercises, creating a 'hostile environment' in which to train. To deliver the service, NATO JEWCS deploys high-tech EW equipment at training sites around Europe, allowing armed forces to practice their skills in areas such as electronic surveillance and electronic countermeasures while facing true-to-life attempts to disrupt their activity.

In delivering this support, it is important that the EW effects being simulated are state of the art, keeping pace with opposing



forces' latest tech developments. Leonardo is Europe's leading provider of electronic warfare technology and training and will be providing representative equipment across three domains: air, land and maritime. In the air, highly capable and flexible pod-based EW systems will be supplied for deployment on aircraft, alongside a NATO Anti-Ship Missile Defence Evaluation Facility (NASMDEF). NASMDEF comprises a set of pods that can be installed on aircraft to simulate anti-ship missiles. They allow forces to train in the use of 'soft-kill countermeasures' which are used to protect ships from incoming threats. Cobham will be Leonardo's principle subcontractor for these elements. For land and maritime applications, fully ruggedized shelters and vehicles will be provided, equipped with modular and flexible EW simulators, stimulators and jamming equipment. Elettronica will act as Leonardo's principal subcontractor for these elements.

Leonardo's electronic warfare expertise includes designing and manufacturing protective and ISR (Intelligence Surveillance and Reconnaissance) equipment for UK and allied aircraft such as the Eurofighter Typhoon and AW159 helicopters, delivering specialist EW training at its Academy in Lincoln

and investing in the development of the latest generation of countermeasures such as the anti-IED 'Guardian' system for troops on the ground and the 'BriteCloud' decoy for fighter jet pilots.

This contract to upgrade electronic warfare equipment is just the latest example of Leonardo's on-going provision of security technology and expertise to NATO. Leonardo is the Alliance's cyber security mission partner, working with the NATO Communications and Information Agency to protect more than 70,000 Alliance users around the world from cyber-attacks. The Company has also provided a significant amount of equipment and support for the NATO Air Command and Control System (ACCS). In October 2018, Leonardo received the NATO Science and Technology Organization's (STO) Scientific Achievement Award for its contributions to the development of a promising new approach to modelling, simulation and training. Leonardo has also provided over 50 air defence radars to multiple Alliance member countries under the NATO Security Investment Program (NSIP) and has delivered its 'Guardian' counter-IED (improvised explosive device) systems to protect NATO vehicles operating in Afghanistan.



Boeing Receives US\$2.4 Billion P-8A Poseidon Contract From U.S. Navy

U.S. Navy orders next group of P-8A aircraft; 19 jets support world-wide customers

The U.S. Navy has awarded Boeing [NYSE: BA] a \$2.4 billion production contract for the next 19 P-8A Poseidon aircraft. The contract includes 10 aircraft to add to the current inventory of P-8As in the U.S. Navy fleet, all five jets currently under contract for Norway and the four aircraft remaining for the existing United Kingdom contract, bringing the total United Kingdom acquisition to nine aircraft.

The United Kingdom and Norway are acquiring the Boeing aircraft through the Foreign Military Sales process and will receive a variant designed and produced for the U.S. Navy called the P-8A Poseidon. The United Kingdom will receive their first aircraft in 2019 and Norway will begin receiving aircraft in 2021.

The P-8 is a long-range multi-mission maritime patrol aircraft capable of broad-area, maritime and littoral operations. A military derivative of the Boeing Commercial Next-Generation 737 airplane, the P-8 combines superior performance and

reliability with an advanced mission system that ensures maximum interoperability in the battle space.

The P-8 is militarized with maritime weapons, a modern open mission system architecture, and commercial-like support for affordability. The aircraft has been modified to include a bomb bay and pylons for weapons – two weapons stations on each wing –

and can carry 129 sonobuoys. The aircraft is also fitted with an in-flight refueling system. With more than 180,000 flight hours to date, P-8 variants, the P-8A Poseidon and the P-8I, patrol the globe performing anti-submarine and anti-surface warfare; intelligence, surveillance and reconnaissance; humanitarian; and search and rescue missions.



Russia will Display the PANTSIR-ME Shipborne Air-Defence Missile and Artillery System for the First Time at IDEX 2019

JSC Rosoboronexport (part of the Rostec State Corporation) and JSC NPO High Precision Systems will arrange the first demonstration within a foreign defence show of the PANTSIR-ME shipborne air-defence missile and artillery system developed and produced by the Instrument Design Bureau JSC KBP named after Academician A. Shipunov.

The presentations of the PANTSIR-ME air-defence missile and artillery system will be held at the IDEX 2019 exhibition on February 18-19, 2019. There will be a full-scale specimen to be demonstrated in the middle of the combined Russian exposition organized by Rosoboronexport, i.e. at the exhibit of the High Precision Systems (09-C20).

"The current trends in the development of navies force maritime powers to equip their ships with reliable assets to counteract air threats, i.e. cruise missiles, unmanned aerial systems, helicopters and planes. A sophisticated system of countering practically all the possible aerial kill assets has been developed in Russia, and it will be represented at one of the largest world-defence exhibitions in Abu Dhabi. The PANTSIR-ME can be installed on most Russian warships and is very well fit for ships manufactured by other countries. I am confident that it has very good export prospects in the Arab countries, South-East Asia and Latin America," said Rosoboronexport's Director General Alexander.

The PANTSIR-ME air-defence missile and artillery system can be set up on ships with water displacement of more than 300 tons. The system provides reliable protection of



vessels from all the existing and prospective air assault weapons in the whole spectrum of their combat capabilities with an unconditional probability of kill, which is practically equivalent to one, including low-flying anti-ship missiles and unmanned aerial vehicles.

"Currently the PANTSIR-ME air-defence missile and artillery system has no direct counterparts in the world market in the segment of shipborne air defence systems, and such will hardly pop up in the near future," noted Sergey Abramov, the industrial director of the Armaments cluster in the Rostec State Corporation, "Demonstration of a full-scale specimen at the IDEX exhibition is a perfect opportunity to present this new state-of-the-art Russian weapon to our partners from the Middle East and Northern Africa – the strategic region of Rostec's presence."

The high effectiveness of intercepting anti-ship missiles

is due to its high performance tactical and technical characteristics of the PANTSIR-ME air-defence missile and artillery system. The system is capable of simultaneous firing at four targets attacking the ship while the kill zone for guided anti-aircraft missiles can reach a distance of 20 kilometers and up to a 15 kilometers in altitude. The PANTSIR-ME can first utilize its missile weapons, and then, in case of a miss, the target will be hit by the artillery fire with a 100 percent guarantee.

The system includes a high-intelligent multimode adaptive radio-optical control system. All the stages of operator work - from the target acquisition to the firing - are completely automated. A combined use of the radio and optical control system provides for the all-weather and round-the-clock operability of the system. All this permits a guaranteed elimination of targets at long distances and in close proximity.



France Launches RAFALE F4 Upgrade

Dassault Aviation has received the F4-standard development contract for the RAFALE Combat Aircraft during the visit of the Dassault Aviation Mérignac plant by Florence PARLY, French Minister of the Armed Forces.

The F4 standard is part of the ongoing process to continuously improve the RAFALE in line with technological progress and operating experience feedback. The F4 standard marks a new step coming in the wake of the standards F1 (specific to the first aircraft of the French Navy), F2 (air-to-ground and air-to-air capabilities), F3 and F3R (extended versatility).

Dassault Aviation will be responsible for implementing innovative connectivity solutions to optimize the effectiveness of the aircraft in networked combat (new satellite and intra-patrol links, communication server, software defined radio).

New functions will also be developed to improve the aircraft's capabilities (upgrades to the radar sensors and front sector optronics, helmet-mounted display capabilities), and new weapons will be integrated (Mica NG air-to-air missile and 1,000-kg AASM Air-to-Ground Modular Weapon).

Lastly, with regard to availability, Dassault Aviation is working under

a through-life support contract which will become more "top-down" under the authority of the aircraft manufacturer. F4 will include a new Prognosis and Diagnostic Aid System introducing predictive maintenance capabilities. Other maintenance optimization features are scheduled, particularly with solutions based on Big Data and artificial intelligence. Lastly, the RAFALE will be equipped with a new engine control unit.

"The F4 standard guarantees that RAFALE will remain at a world-class level so that our combat

air forces can carry out all their missions with optimum efficiency, whether in coalition operations or completely independently, as required by the French nuclear deterrent, stated Eric TRAPPIER. This new standard also guarantees that RAFALE will remain a credible reference on the export market. Lastly, it confirms the continuous improvement approach and helps develop the manufacturers' skills."

Validation of the F4 standard is planned for 2024, with some functions becoming available as of 2022.



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Rheinmetall and BAE Systems to Create a UK Based Land Systems Joint Venture

Rheinmetall and BAE Systems announced that they have signed an agreement to create a joint UK based military vehicle design, manufacturing and support business on 21 January. The new Joint Venture will be headquartered at BAE Systems' facility in Telford, England and will sustain over 400 jobs in the UK, as well as preserve key technology and engineering skills.

Rheinmetall will purchase a 55 percent stake in the existing BAE Systems UK based combat vehicles business, with BAE Systems retaining 45 percent. The establishment of the new Joint Venture is subject to regulatory approvals which are anticipated to be completed in the first half of 2019. Once the approvals have been completed, the Joint Venture will be known as Rheinmetall BAE Systems Land (RBSL).

In addition to managing and growing the existing combat vehicle support business, the intent is for the new Joint Venture to play a major role in the delivery of the British Army's new Mechanized Infantry Vehicle (MIV) and other strategic combat vehicles programs.

While initially focused on these major UK programs, RBSL will also form an integral part of Rheinmetall's Vehicle Systems Division and will participate in and contribute to various global military vehicle pursuits and contracts. The combination of Rheinmetall's military vehicles technology and products with the additional capabilities and products brought to the Joint Venture by BAE Systems, such as Trojan, Terrier, Warrior, military bridging and the AS90 self-propelled artillery system will create a European market leader in the military vehicle sector. RBSL will have the potential to create hundreds of additional UK



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jobs, both in Telford and the wider supply chain.

Ben Hudson, global head of Rheinmetall's Vehicle Systems Division said "We are excited about the potential the new Joint Venture holds for Rheinmetall, BAE Systems and ultimately our customers. The combined capabilities of our two great companies will offer our customers a comprehensive portfolio of military vehicles and associated technologies both now and into the future. We are proud to invest in the UK and expect to substantially grow the current business and the Telford manufacturing facility over the coming years."

Jennifer Osbaldestin, Managing Director of BAE Systems Land UK business, said "We are committed to evolving our combat vehicles business so that we better serve our customers' future interests. Joining forces with Rheinmetall in the UK provides renewed purpose for our vehicles business and allows us to deliver products, services and technology that help land forces excel in their vital roles. We look forward to working together to ensure the Joint Venture is a trusted supplier to the British Army and our international customers."



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Boeing Autonomous Passenger Air Vehicle Completes First Flight

Boeing NeXt program tests prototype to advance safety and technology of urban air mobility
Electric vertical takeoff and landing vehicle has design range of up to 81 kilometre

On 23th January, Boeing has successfully completed the first test flight of its autonomous passenger air vehicle (PAV) prototype in Manassas, Virginia. Boeing NeXt, which leads the company's urban air mobility efforts, utilized Boeing subsidiary Aurora Flight Sciences to design and develop the electric vertical takeoff and landing (eVTOL) aircraft and will continue testing to advance the safety and reliability of on-demand autonomous air transportation.

The PAV prototype completed a controlled takeoff, hover and landing during the flight, which tested the vehicle's autonomous functions and ground control systems. Future flights will test forward, wing-borne flight, as well as the transition phase between vertical and forward-flight modes. This transition phase is typically the most significant engineering challenge for any high-speed VTOL aircraft.

"In one year, we have progressed from a conceptual design to a flying prototype," said Boeing Chief Technology Officer Greg Hyslop. "Boeing's expertise and innovation have been critical in developing aviation as the world's safest and most efficient form of transportation, and we will continue to lead with a safe, innovative and responsible approach to new

mobility solutions."

Powered by an electric propulsion system, the PAV prototype is designed for fully autonomous flight from takeoff to landing, with a range of up to 50 miles (80.47 kilometers). Measuring 30 feet (9.14 meters) long and 28 feet (8.53 meters) wide, its advanced airframe integrates the propulsion and wing systems to achieve efficient hover and forward flight.

"This is what revolution looks like, and it's because of autonomy," said John Langford, president and chief executive officer of Aurora Flight Sciences. "Certifiable autonomy is going to make quiet, clean and safe urban air mobility possible."

The test flight represents the latest milestone for Boeing NeXt. The division works with regulatory agencies and industry partners to lead the responsible introduction

of a new mobility ecosystem and ensure a future where autonomous and piloted air vehicles safely coexist. In addition to the PAV, the Boeing NeXt portfolio includes an unmanned fully electric cargo air vehicle (CAV) designed to transport up to 500 pounds (226.80 kilograms) and other urban, regional and global mobility platforms. The CAV completed its first indoor flight last year and will transition to outdoor flight testing in 2019.

"Boeing was there when the aviation industry was born and in our second century, we will unlock the potential of the urban air mobility market," said Steve Nordlund, vice president and general manager of Boeing NeXt. "From building air vehicles to airspace integration, we will usher in a future of safe, low-stress mobility in cities and regions around the world."



Allison Transmissions Chosen for the U.S. Marine Corps' new 8x8 Amphibious Vehicles

Iveco Defense Vehicles will support BAE Systems in the frame of their recently-awarded contract to produce the next generation of Amphibious Combat Vehicles

Optimizing all aspects of operational mobility, Allison Specialty Series™ transmissions will equip the new generation of Amphibious Combat Vehicles (ACV 1.1) for the U.S. Marine Corps (USMC).

The vehicles are being produced under a four-year, \$400 million contract won by BAE Systems, with support from Iveco Defense Vehicles, a leading provider of integrated and protected mobility solutions to military and civil protection customers. The first order by the USMC is for 30 vehicles, with future options for a total of 204 new vehicles.

Iveco has chosen the reliability and technology of Allison fully automatic transmissions. This collaboration has already designed and built technologically advanced armored vehicles for the Spanish Army and now for the US Marines.

The ACV 1.1 is an advanced, 8x8 ocean-capable vehicle, with a new, 700hp six-cylinder engine optimized for use with the Allison 4800SP™ transmission. The military vehicle offers best-in-class mobility on all terrain and has an internal structure that can accommodate 13 Marines with increased survival protection than currently fielded systems.

The first 16 prototypes were delivered last year to enable the Marines to evaluate the performance of the amphibious vehicles. During this period, the Iveco/BAE teams, together with Allison's engineers, supported the Marine Corps evaluation by conducting numerous tests on risk situations, water operations and ground mobility. The performance of the vehicles has



© Iveco Defense Vehicles

Allison transmissions will equip the new generation of Amphibious Combat Vehicles (ACV 1.1) for the U.S. Marine Corps, produced by BAE Systems with support from Iveco Defense Vehicles.



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The ACV 1.1 is an 8x8 ocean-capable vehicle with a new, 700hp six-cylinder engine optimized for use with the Allison 4800SP™.



© Allison Transmission

Allison's fully automatic 4800SP™ transmission fitted in the ACV 1.1 is ideal for military and exceptional transportation (HET) applications, ensuring maximum reliability and durability.

achieved excellent results.

Allison's Specialty Series transmissions are dedicated to military, exceptional transportation (HET), and other severe applications--ensuring maximum reliability and durability. "The 8x8 wheeled vehicle is a state-of-the-art vehicle—a

concentration of technology that brought new know-how during the testing phase," said Simona Pilone, OEM Account Manager at Allison Transmission. "No special adaptations to the Allison transmission were necessary. However, some tailored functional and electronic

integration adaptations have been developed.”

Allison fully automatic transmissions are the best option on military vehicles, allowing drivers to focus on their mission and reduce cognitive stress. Our Continuous Power Technology™ offers uninterrupted power to the drive wheels, smooth take off, low speed control and maneuverability. Transmission mounted Power Take-Offs (PTO) provide installation flexibility and the ability to power vehicle-mounted specialty equipment such as winches and central tire inflation.

Allison Transmission has been supporting the U.S. military since 1917, when it began supplying engines for fighter aircraft. In later years, Allison began supplying automatic transmissions for tracked and wheeled military vehicles.

About Allison Transmission

Allison Transmission (NYSE: ALSN) is the world's largest manufacturer of fully automatic transmissions for medium- and heavy-duty commercial vehicles, and is a leader in electric hybrid-propulsion systems for city buses. Allison transmissions are used in a variety of applications including refuse, construction, fire, distribution, bus, motorhomes, defense and energy. Founded in 1915, the company is headquartered in Indianapolis, Indiana, USA and employs approximately 2,700 people worldwide. With a market presence in more than 80 countries, Allison has regional headquarters in the Netherlands, China and Brazil with manufacturing facilities in the U.S., Hungary and India. Allison also has approximately 1,400 independent distributor and dealer locations worldwide. For more information, visit allisontransmission.com.

Raytheon/Lockheed Martin Javelin Joint Venture Awarded Contract For 2,100 F-Model Missiles, Marking Initial Full-Rate Production

The Javelin Joint Venture was awarded a production contract for 2,100 F-Model (FGM-148F) missiles, following a successful and rigorous system qualification test program that included 21 successful flight tests. The contract launches the initial full-rate production agreement for the Javelin F-Model missile, replacing the Javelin FGM-148E (Block I).

The Javelin FGM-148F missile features an advanced multipurpose warhead (MPWH) as part of the man portable, fire-and-forget Javelin missile system. The MPWH incorporates the latest generation shaped charged technology to defeat present and future advanced armored threats while adding a fragmenting steel warhead case to significantly improve lethality against soft targets and light armored vehicles. The Javelin F-Model round deliveries are planned for early 2020 and will be available for international allies, with U.S. government permission.

There are also funded efforts underway to develop a higher performance Lightweight Command Launch Unit (CLU) and FGM-148G Model missile that will dramatically improve system performance while reducing weight and lowering system cost.

First deployed in 1996, Javelin is the world's most versatile and lethal one-man-portable and platform-employed anti-tank and multi-target precision weapon



system. To date, more than 45,000 missiles and 12,000 CLUs have been produced. The Javelin weapon system has experienced numerous technology insertions since its initial fielding to stay ahead of advancing threats.

Javelin, which is produced by a joint venture between Raytheon and Lockheed Martin, has been used extensively and to great advantage in combat operations in both Afghanistan and Iraq. Over 5,000 engagements have been successfully conducted by U.S. and coalition forces. Current U.S. allies that have Javelin in inventory include France, Taiwan, Jordan, Qatar, Turkey, Lithuania, Czech Republic, Indonesia, Ireland, New Zealand, Norway, Oman, Ukraine, Georgia, Australia, Estonia, UAE and the United Kingdom. The Javelin Joint Venture is an award-winning enterprise recognized in 2015 by the Office of the Secretary of Defense for its outstanding achievements in providing operational support to warfighters with the highest level of mission success and tactical operational readiness.

Lockheed Martin Rolls out the Royal Netherlands Air Force's First Operational F-35A Lightning-II

Dutch and American officials celebrated the roll out of the first operational F-35A Lightning II for the Royal Netherlands Air Force (RNLAf) at Lockheed Martin in Fort Worth, Texas, commemorating a transformational leap in capability for the future of the Netherlands' national defense.

"Receiving this F-35 at Leeuwarden Air Base later this year is going to be a huge driver for change for our Air Force and will have tremendous impact on the relevance of our Air Force as part of the coalition," said Lt. Gen. Dennis LUYT, Commander, RNLAf. "We want to be among the best air forces of the world, and the platform of F-35 allows us to do that."

Various distinguished government, military and industry guests joined LUYT in attendance at the ceremony including Lockheed Martin Chairman, President and CEO Marillyn HEWSON; State Secretary, the Netherlands Ministry of Economic Affairs Mona KEIJZER; and Special Envoy F-35, the Netherlands Ministry of Economic Affairs Maxime VERHAGEN.

"From the very beginning of the F-35 program, the Netherlands has been a key partner in developing, testing, improving, and maintaining this remarkable aircraft," said HEWSON. "Dutch suppliers have provided high-volume production, structural-design support, and advanced technologies, and Dutch aircraft and personnel continue to support ongoing testing and operations for the worldwide F-35 fleet. As we look to the future, the Netherlands will serve as a sustainment hub in the European region for maintenance, repair, overhaul, and upgrade projects."

Following the ceremony, the aircraft is scheduled to ferry to Luke Air Force Base, Arizona, where F-35A pilot training takes place. The aircraft is the first operational F-35 and the third Netherlands jet delivered to date. The first two Dutch F-35s were delivered in 2013



and are at Edwards AFB, California, supporting operational testing. The RNLAf plans to acquire 37 F-35As.

Netherlands F-35 Program History

As one of the original nine partner nations for the F-35, and the second international partner to receive the F-35, the Netherlands continues to be a key contributor to the development, production and sustainment of the F-35 program.

The Dutch Parliament approved an order for eight Lockheed Martin F-35As in March 2015, confirming the aircraft as the official replacement for the F-16 for the Royal Netherlands Air Force. This lot of eight F-35s will be delivered in 2019. The current program of record for the Netherlands is for up to 37 aircraft.

In May 2016, the F-35 landed on Dutch soil for the first time, showing the nation their new 5th Gen fighters. While in the Netherlands, the F-35 performed several "experience flights" to allow the Dutch public to evaluate the difference between the F-35 and legacy fighters, the F-16, noise levels. The test results showed negligible differences between the

noise levels of these two aircraft.

Netherlands Economic Impact

The design expertise, development and manufacturing proficiencies Dutch industry bring to the F-35 will ensure future economic growth and national security for the Netherlands.

Dutch Industry including 25 suppliers continues to benefit from the F-35 program with contracts awarded for high technology work. As estimated by the Ministry of Economic Affairs, the F-35 has already generated more than \$1B in contracts for Netherlands Industry, creating thousands of direct and indirect jobs for this country over the next 30-40 years.

Dutch industry is currently participating in high volume production, critical technology development and strategic structural design ventures that are integral to the F-35 program. Key industrial partners include Fokker Technologies, Aeronamic, Thales, NLR, Airbus Defense and Space, and DPCC. Dutch Industry will continue building F-35 parts for over 3,000 aircraft over the next 30+ years.

The Netherlands was also assigned four major European regional sustainment projects: Engine Maintenance, Repair, Overhaul, and Upgrade (MRO&U), Landing Gear Component MRO&U, PTMS MRO&U, and Regional Warehousing.



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