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A LOOK AT THE TURKISH DEFENSE INDUSTRY LAND PLATFORMS/SYSTEMS SECTOR

EFES 2018 COMBINED JOINT LIVE FIRE EXERCISE

PAKISTAN TO PROCURE 30 T129 ATAK HELICOPTER FROM TURKEY

TURAF'S FIRST F-35A MAKES MAIDEN FLIGHT

TURKISH DEFENCE & AEROSPACE INDUSTRIES 2017 PERFORMANCE REPORT

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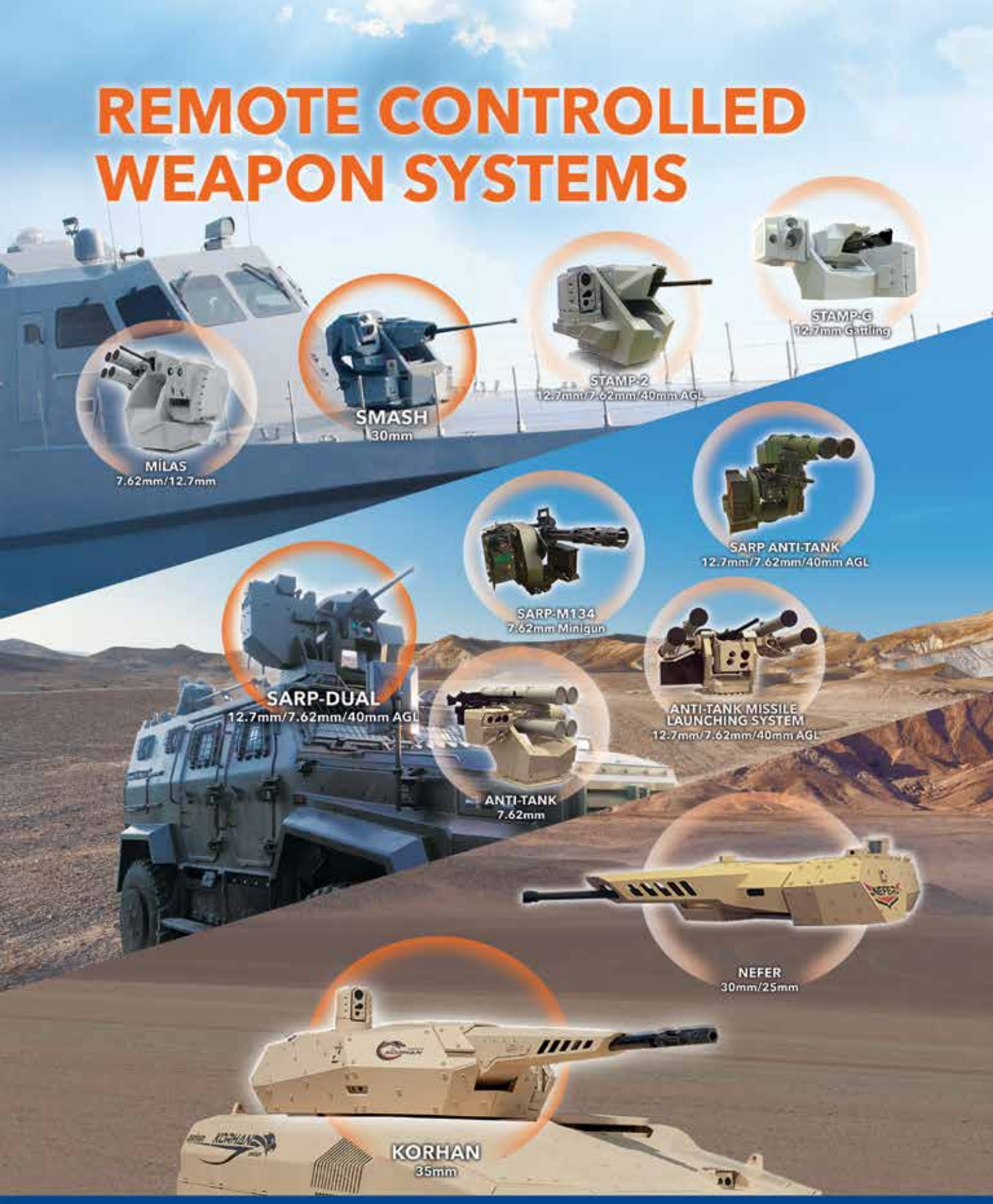

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Defense Industry Exports Gaining Momentum for the Year 2018

Ayşe Evers
Publisher & Editor in Chief

According to figures of the Turkish Exporters Assembly which were shared publicly during the Elective Regular General Assembly of the Defense and Aerospace Industry Exporters Association on April 24 in Ankara, the Turkish Defense Industry's total exports totaled $1.739 billion in 2017 excluding foreign exchange gaining services. The SaSAD's Defense Industry 2017 Performance Report, which was anxiously awaited following the announcement of these figures, was shared with the members of the sector council with the presentation of SaSaD Secretary General Hüseyin Baysak during the TOBB Defense Industry Assembly held in Ankara on May 17.

The Defense Industry 2017 Performance Report, which was distributed to all SaSaD members and special members and arranged as a result of the responses of 86 members, points out that the Turkish defense industry endured a roller-coaster year in 2017. There was a 12% increase in total turnover compared to the previous year, while a 7% decline in foreign sales revenues. Despite the fact that foreign sales figures for 2017 (excluding foreign exchange gaining services) increased by 3% compared to the previous year, it is observed that export figures fell behind the year 2014 because of the sharp fall in foreign exchange gaining services in 2017. The 32.39% decline in domestic and foreign orders in 2017 compared to the previous year undoubtedly constitutes the most important part of the report. Nevertheless, the 31% increase in employment compared to the previous year, and the fact that the resource allocation by the government for product & technology development has continued to increase steadily over the last five years are one of the positive developments in this report for 2017.

Following a stable year in 2017, the contracts signed between the Qatari Armed Forces and Turkish defense industry companies at an amount of $800 million USD at DIMDEX 2018 Fair on March 12-14 and the contract signed between Pakistan and Turkey for the supply of 30 T129 "Atak" helicopters are really important and also demonstrate to us the potential of our defense industry. These sales may not immediately reflect on export figures in the short term, but the first data obtained for 2018 points to an increase of 17.24% in Q1 foreign sales revenue of this year compared to the Q1 in 2017. It would not be wrong to evaluate that 2018 will be different from the previous year for the Turkish Defense Industry, which achieves growth in foreign markets also by giving support with new programs and orders to be activated within the country.

In our new issue, we analyze the 2017 Turkish Defense Industry Performance Report in detail with all breakdowns, we give you a closer look at the Turkish Land Systems and Platforms, the locomotive of the Turkish defense industry and compiled the latest status of the Turkish Land Systems programs. We also bring you up to date on all of the recent major industry events and fairs as well as information on up-coming events, sectoral news and technical articles. We extend a special thank you to Arzu Baytar from GES Engineering and Elif Gürdal from and Dassault Systems who contributed their interviews.

Enjoy this issue… ■

A Look at the Turkish Defense Industry Land Platforms/Systems Sector

by İbrahim SÜNNETÇİ - Editor

As a result of policies implemented by Turkey's defense and security procurement agency the Undersecretariat for Defense Industries (SSM), over the last decade aimed at boosting the local defense industry and improving self-sufficiency in defense system procurements, the Turkish Defense and Aerospace Industry has reached a high degree of self-sufficiency. According to Undersecretary for Defense Industries, Prof İsmail Demir, Turkey's domestic industry has reached a level of capability in which it can now meet around 70% of the military system requirements of the Turkish Armed Forces (TAF)

SSM has been meeting the Turkish Armed Forces' (TAF) wheeled armored vehicles requirement from local sources since late 1980s. As one of the strongest sectors of the Turkish Defense and Aerospace Industry, the Land Platforms Sector is now able to meet almost all of the requirements for the Turkish Land Forces (TLF), Gendarmerie General Command (GGC) and Security General Directorate (SGD/ Turkish National Police) for tracked and wheeled armored vehicles with indigenous solutions, with the next target in this field being the design, development and manufacture of a 3+ Generation Main Battle Tank.

Turkey has traditionally looked to its domestic suppliers to meet the TAF's Land Platforms requirements, which has enabled the Sector to develop a comprehensive range of products, ranging from tactical wheeled vehicles (4x4, 6x6, 8x8 and 6x4), tactical wheeled armored vehicles (4x4, 6x6 and 8x8), armored reconnaissance vehicles (tracked and wheeled), armored internal security vehicles, mine protected vehicles, mobile floating assault bridges, riot control vehicles, amphibious armored combat earthmovers, armored combat vehicles and the ALTAY MBT, as well as modernization and upgrade solutions for APCs, ACVs and MBTs. Locally produced armored vehicles especially Otokar's 4x4 COBRA-I and COBRA-II, Nurol Makina ve Sanayi (NMS)'s EJDER YALÇIN-I/ II/III and BMC's KİRPİ MRAPs have been playing an important role in Turkey's war against the PKK terrorist organization and thanks to their high protection capability they saved the lives of many soldiers during recent operations by withstanding several roadside and IED bomb attacks.

The backbone of the Turkish Land Platforms/Systems sector is formed by private companies such as Otokar, FNSS, BMC, Nurol Makina ve Sanayi (NMS) and Katmerciler. Military Factories operated by the Turkish Land Forces (TLF), such as the 1st Main Maintenance Center in Adapazarı and the 2nd Main Maintenance Center Command in Kayseri have played a key role in Main Battle Tank Modernization projects such as the Leopard 1T and M60T programs and are now providing maintenance services to tracked and wheeled vehicles of the TLF. It should be noted that as part of the restructuring efforts that were launched following the coup attempt on July 15, 2016, with an amendment made on the 1st Article of Law on Ministry of National Defense (MoND) military factories and shipyards have been removed from the structure of related Military Departments and General Staff organization and affiliated under the MoND. In this context the Military Factories of the Turkish Land Forces such as the 1st Main Maintenance Center in Adapazarı and the 2nd Main Maintenance Center Command in Kayseri have been affiliated under the newly established (on July 25, 2016) MoND General Directorate of Military Factories (AFGM) on November 9, 2016 and with State of Emergency Decree Law No. 696 issued on December 24, 2017 Military Factory and the Shipyard Management Incorporated Company (ASFAT AŞ) was established.

According to the Turkish Defense and Aerospace Industry 2017 Performance Report prepared by the Defense Industrial Manufacturers Association (SaSaD) through the evaluation of figures obtained from member companies and issued in May 2018, realizing around 36% (US$2.362 Billion) of the turnover (US$6.693 Billion), around 29% (US$522 Million) of the exports (US$1.824 Billion), around 29% (around US$540 Million) of the imports (US$1.544 Billion), and around 31% (US$2.478 Billion) of the order total (US$8.055 Billion) in 2017 the Turkish Land Platforms/Systems sector is likely the strongest sector of the Turkish Defense & Aerospace Industry. According to the Turkish Defense and Aerospace Industry 2016 Performance Report in 2016 the Turkish Land Platforms/Systems Sector realized 29% (US$1.702 Billion) of the turnover (US$5.968 Billion), around 30% (US$488 Million) of the exports (US$1.678 Billion), and around 50% (US$5.920 Billion) of the order total (US$11.913 Billion). All estimates show that the Turkish Land Platforms/Systems Sector will grow further in 2018. Products are made according to NATO standards and more cost effective than most in the West and the sector is ready to share its technology with its customers. The Turkish Land Platforms/Systems Sector has become a valid alternative to the West and thus during last decade land platforms have become important export items within Turkish defense exports.

Remarkable Programs and Products of the Land Platforms/Systems Sector

ALTAY Turkish National Main Battle Tank

Under the ALTAY Turkish National Main Battle Tank Program, Main Contractor Otokar has developed a 3rd Generation+ MBT in cooperation with its local partners (Aselsan, MKEK, Roketsan and STM, under the project Otokar cooperated with 109 subcontractors of which 20 were foreign companies) and South Korean Hyundai/Rotem, which was selected as the Technical Support and Assistance Provider (TSAP), to meet Turkish Army requirements. Awarded on July 29, 2008 and became effective on January 15, 2009, the first phase of the program is valued at US$494 Million (the South Korean portion accounting for roughly US$200 Million) and consists of three stages: Conceptual Design, Detailed Design and Prototyping and Qualification, and covers the design, development, manufacture and testing of four prototype vehicles; Mobility Test Rig (MTR), Fire Power Test Rig (FTR), Prototype Vehicle 1 (PV-1), Prototype Vehicle 2 (PV-2) as well as 1 Full Scale Dummy (used in live HEAT, KE, ATGM firing tests and mine tests) in about 7 years with the use of existing local capabilities to the maximum extent.

Under the Program, Stage III Prototype Development and Qualification activities started in May 2013. PV-1 and PV-2 prototypes have been manufactured in this Stage and System Qualification tests of PV-1 prototype started in April 2015 and PV-2's in February 2016. PV-1, has been utilized for mobility and survivability qualification tests, and PV-2 has been utilized for firepower qualification tests. System Qualification Tests completed successfully on November 7, 2016 and Acceptance Tests, which have been carried out by the Turkish Land Forces Command (TLFC) and SSM, were completed at the end of February 2017.

While Acceptance Tests were on-going Otokar submitted its proposal for the Series Production Phase on January 18, 2016. The SSM issued the RFP for Series Production Phase to Otokar in 2015. Upon the SSM's request, Otokar submitted its Best and Final Offer (BAFO) for the serial production of 250 ALTAY MBTs in five years and their Integrated Logistics Support activities on August 29, 2016. Following the evaluation of the proposal submitted by Otokar, SSM on June 9, 2017 informed the company that its proposal was not approved, and the requirement would be met via a new tender process. The SSM issued a Request for Proposal (RFP) for the Series Production Phase on July 1, 2017. Bidders for the Series Production Phase were; Otokar, FNSS and BMC.

In October 2016 BMC (51% share), Rheinmetall AG (39% share) and the Malaysian company Etika Strategi (10% share) formed an Ankara, Turkey-based Joint Venture Company 'Rheinmetall BMC Savunma Sanayi AŞ' (RBSS) with a view to cooperation in armored vehicles solutions.

Bidders submitted their Series Production Phase proposals to the SSM on November 16, 2017. Upon the SSM's request they submitted their first BAFOs on February 8, 2018 and the second BAFOs on March 5, 2018. Meanwhile Defense Industry Executive Committee [DIEC] meetings were held on January 31, 2018 and March 29, 2018. During March 29th meeting DIEC, the highest decision-making body on defense procurement in Turkey, selected BMC as the Prime Contractor for the Series Production Phase of ALTAY MBT and the National Unique Power Pack Development Program for the ALTAY MBT and gave green light to the SSM to start contractual negotiations with BMC. On April 24, 2018 Undersecretary Prof. İsmail Demir, announced with a tweet that under the ALTAY MBT Series Production Phase, covering 250 MBTs, and the National Power Pack Development Program, the SSM would initiate contractual negotiations with BMC in compliance with DIEC's decree. On April 25, 2018 BMC announced that they have been invited by the SSM for the contractual negotiations for the ALTAY MBT Series Production Phase and the National Power Pack Development Program. On May 17, 2018, speaking at the TOBB Turkish Defense Industry Assembly Meeting Undersecretary Prof. Demir announced that the ALTAY MBT Series Production Phase contract would be inked soon with BMC. "We are about the sign contract", he said.

Series Production of ALTAY MBTs at BMC Karasu facilities is expected to start during late 2019 or in early 2020.

Under the Series Production Phase, a total of 500 ALTAY MBT is expected to be procured in two batches and 50 more ALTAY MBT chassis are also expected to be manufactured and integrated with a mine breaching system to meet the Turkish Army's 50 Mine Cleaning System requirements and some more for Armored Recovery Vehicle configuration. On January 16, 2018 the SSM issued Request for Information (RFI) to potential local companies for the procurement of Mine Cleaning Systems to be integrated on ALTAY chassis and on January 31, 2018 another RFI was issued under the Armored Recovery Vehicle (ARV) Program. The ARV will be based on the ALTAY MBT chassis.

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EuroPowerpack	
Power Pack Layout	U-Type
Engine	MTU MT883 Ka-501CR
Engine Max. Power	1.100kW (1.496HP) @ 2.700rpm
Number of Cylinders / Layout	12/V90°
Engine Volume	27.4 l
Transmission	RENK HSWL 295TM
Gears	5 forward-3 reverse
Steering	Hydrostatic-Hydrodynamic

ALTAY pre-prototypes and prototypes are powered by EuroPowerpacks mounted in a 'U Configuration'. Otokar already received five power packs from MTU under a €12 Million contract signed in October 2010 and integrated four of them onto MTR, FTR, PV-1 and PV-2 vehicles. The EuroPowerpack incorporates V-12 type MTU MT883 Ka-501CR diesel engine (27,35 liters, dry weight is 1,800kg) coupled to RENK's HSWL 295TM automatic transmission (with 5 forward and 3 reverse gears, dry weight is 2,450kg) and a cooling and air filtration system.

Some of the ALTAY MBTs to be produced during the course of the Series Production Phase are planned to be equipped with an indigenous power pack. Under the National Power Pack Development Program, on March 17, 2015 the SSM awarded a €190 Million contract to local company Tümosan for the development of an indigenous power pack with 1,500hp to 1,800hp diesel engines to be coupled with a hydro-mechanical transmission for the ALTAY MBT. According to contract the SSM should have been an owner of full intellectual property rights and export rights to the power pack. Tümosan selected well-known Austrian AVL List GmbH Company as its Technical Support and Assistance Provider and signed a contract with AVL on October 7, 2015. However, at the end of 2016, the Austrian government refused to provide Export License to AVL. According to contract clause AVL should have delivered the Export License to Tümosan by January 6, 2017. As a result, in January 2017, Tümosan terminated the cooperation agreement with AVL. At the end of an approximate two-year process the SSM dissolved the National Power Pack Development Program contract with Tümosan on February 24, 2017. SSM launched a new tender for the National Power Pack Development Program and RFP document was issued in October 2017. Bidders submitted their proposals on December 22, 2017 and following the evaluation of the proposals BMC (BMC Power) was selected as the winner during the March 29, 2018 DIEC meeting. The

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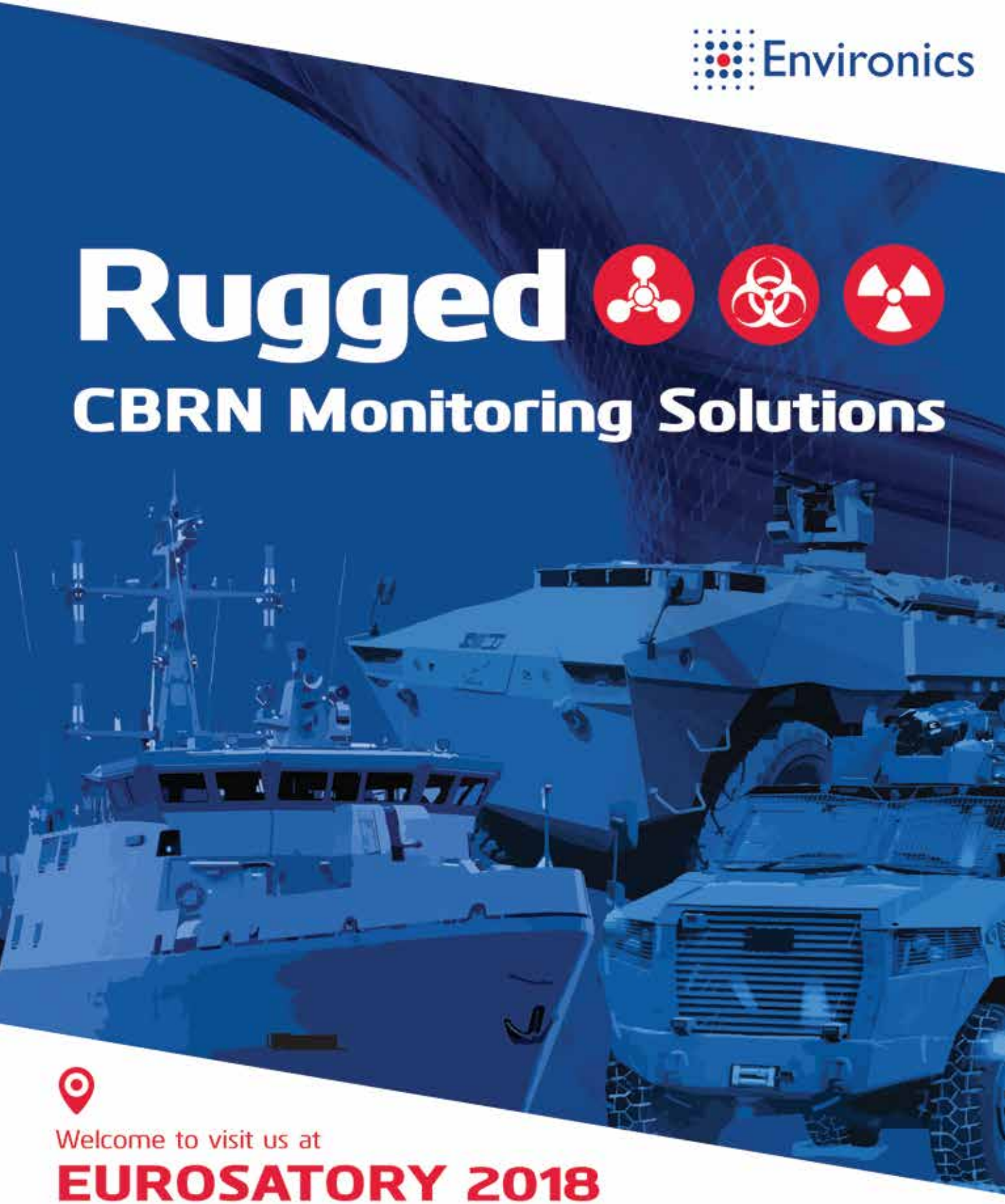

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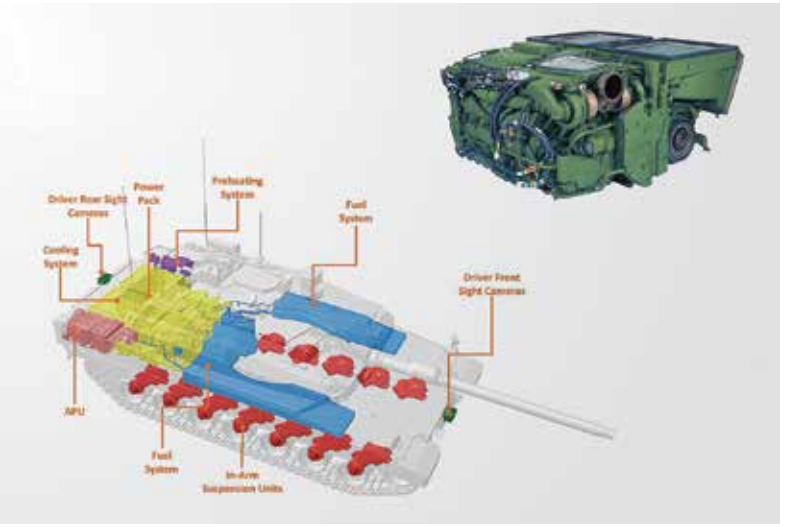
program will be carried out in two phases; Prototype Development and Series Production.

Located at Teknopark Istanbul, BMC Power was also selected under the New Generation Armored Combat Vehicle (NGACV) Power Pack Development Program by the DIEC on October 28, 2016 and a contract was signed between the company and the SSM on October 13, 2017. Under the program BMC Power will design, develop, test, qualify and deliver a power pack to be consisted of a 675kW (905hp), V8 type 18-liter diesel engine coupling with an automatic transmission under a 68-month schedule. The contract became effective on January 4, 2018 and 'To' started. According to BMC officials currently 200 engineers including 70 foreign engineers are working on the power pack.

The ALTAY MBT is operated by a crew of four, consisting of a commander, gunner, loader and driver. The commander is seated on the right side of the turret, with the gunner forward and below his position and the loader on the left side of the turret. The commander's panoramic periscope is mounted in front of the loader's hatch. The tank's main weapon is a 120mm 55-calibre smoothbore gun fitted with a thermal sleeve; fume extractor and a muzzle reference system. Ready to use 120mm ammunition is bestowed in the turret bustle with blow out panels in the roof. The loader's hatch has a ring mount for a 7.62mm machine gun, and Aselsan's SARP Remote Controlled Weapon Station (RCWS), armed with .50-calibre (12.7mm) machine gun, is mounted on the left side of the turret roof (behind the loader's hatch), for operation by the commander.

The ALTAY MBT measures 10.85m in length, 3.68m in width and 3.32m in height, with a combat weight of 63.5 tons. Thanks to its powerful EuroPowerpack, ALTAY MBT could accelerate from 0 to 32km/h (0 to 20mph) in 6 seconds and attains a maximum speed of 65.5km/h, the speed and agility also helps to improve survivability. The ALTAY MBT can cruise 450km with internal fuel.

Protected with modular composite armor developed by Roketsan, the ALTAY MBT is already equipped with the Aselsan built 360° Situational Awareness System, a Laser Warning



Receiver (LWR) and a Battlefield Target Identification (IFF) System. The Indigenous Active Protection System (APS) is also being developed by Main Contractor Aselsan under the AKKOR Project valued at €54 Million, which includes design, development, test, qualification and production of two prototypes of Prototype-I (AKKOR-G1 for the MBTs) and two prototypes of Prototype-II (AKKOR-G, for the wheeled armored vehicles) and delivery of the prototypes to the SSM will take place in 2020. According to Aselsan development of the AKKOR APS sensor units started in 2008 and the development of the countermeasure was initiated in 2010. The AKKOR APS consists of an EW Computer, TLUS (soft-kill section), Physical Destruction Radar (FIRAD, four flat radar panels), Physical Destruction Munitions (FIM, HE blast grenades), Physical Destruction Launchers (FIMA, two twin launchers), Display Unit and a Control Panel. The CDR Phase of AKKOR APS was completed on December 25, 2017.

According to SSM figures the Development Phase of the Program is valued at US$550 Million and each ALTAY MBT is expected to cost Turkey around €13,75 Million.

BMC will perform Series Production of ALTAY MBTs and National Power pack for the ALTAY MBTs at its Karasu facilities, being constructed with an investment worth US$400 Million at Karasu, Kocaeli. The 220-hectare Karusu facilities will include four separate factories/plants and five production lines for Wheeled Armored Vehicles (BMC and RBSS), Tracked Armored Vehicles (BMC and RBSS), Light Commercial Vehicles (BMC), Rail System (BMC) and Engine (BMC Power). The first part of the Karasu facilities with an indoor area of 150.000m2 will become operational in 2019 and in 2023 the total indoor area will reach 550.00m2. According to BMC, the number of employees at the Karasu facilities will reach 10,000 in 2025 and 3,000 of them would be R&D engineers. RBSS will also have a production line at the Karasu facilities and the company is making an investment worth US$60 Million for this new plant.

AKKOR APS

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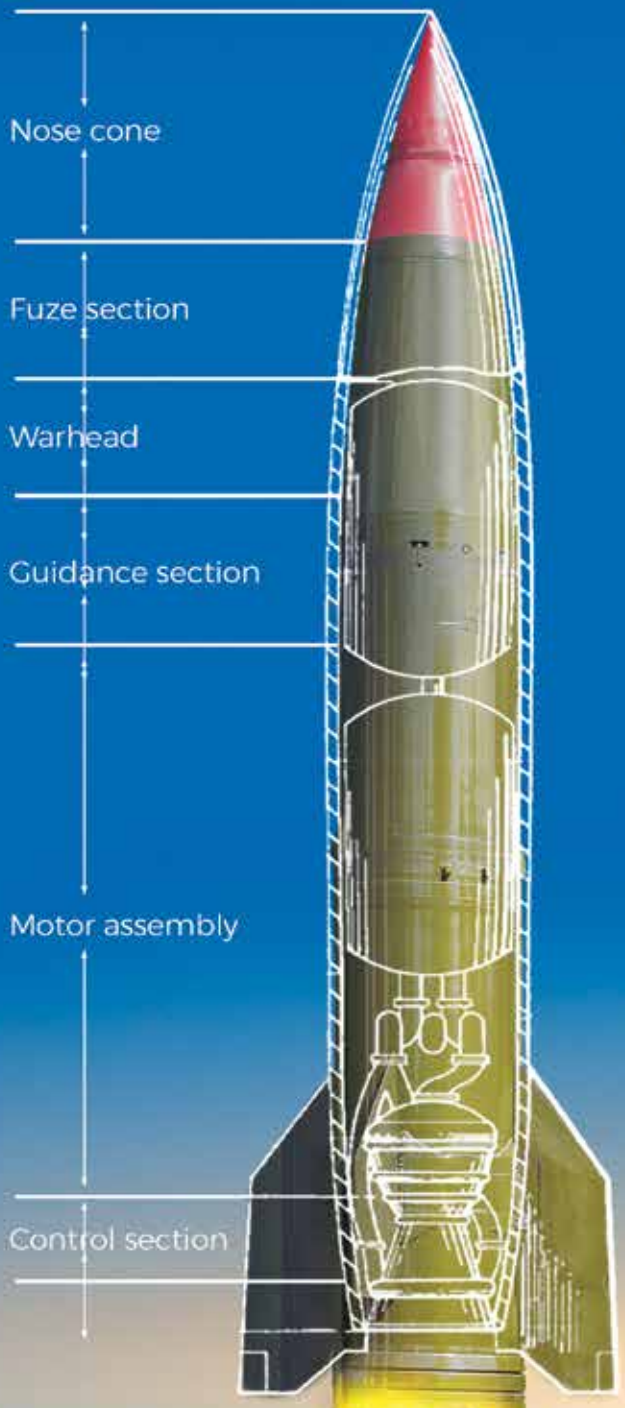

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M60 and Leopard 2A4 MBT Modernization

Soon after several Turkish M60A3, M60T and Leopard 2A4 MBTS were hit by Kornet-E/AT-14, Milan, TOW-II, 9K115-2 Metis-M and Fagot/AT-4 Anti-Tank Guided Missiles (ATGMs) launched by the Islamic State (ISIS) and YPG/PKK militants during Operation Euphrates Shield (carried out during August 24, 2016 – March 29, 2017) in Syria, in January 2017 the SSM launched a tender for the modernization of 120 M60T, 40 M60A3 and 81 Leopard 2A4 MBTs to improve their protection level and to increase their survivability against modern ATGM threats.

In a large number of Turkish Army tanks deployed in Syrian territory during Operation Euphrates Shield. During Operation Euphrates Shield several armored vehicles were hit by ATGMs fired by ISIS and YPG/PKK terrorists. Most of these vehicles were damaged not destroyed and were later overhauled and repaired at the 2nd Main Maintenance Center (2nd MMC) in Kayseri and in Çobanbey/Gaziantep, where maintenance services were given to armored vehicles that participated in Operation Euphrates Shield. Thanks to their modern hybrid armor (both active and passive) M60T MBTs survived even after they were hit by more than one ATGMs and managed to protect their crew.

As of January 23, 2017, five local companies (Aselsan, BMC, FNSS, Otokar, and Roketsan) submitted their bids to the SSM. During the IDEF '17 Fair, on May 11, 2017, a contract valued at Euro109.245 Million + TL25 Million was signed between Aselsan and the SSM for the modernization of M60T MBTs to increase their survivability against modern ATGM threat, their firepower and their situational awareness. Under the 'M60T FIRAT (Euphrates) Modernization Program' Aselsan, in cooperation with 2nd MMC, integrated a 12,7mm SARP RCWS, YAMGOZ Close-Range Surveillance System (360° Situational Awareness System), Tank Laser Warning Receiver System (TLUS, to detect, classify, identify and give warning of laser threats aiming on the platform such as; Laser Range Finders, Laser Designators and Laser Beam Riders), Tank Driver Vision System (TDVS), Smoke Grenade Launchers, Air Conditioning System, Auxiliary Power Unit (APU), Audible Warning System and Protective Coating (at the turret walls and ceiling, to maximize crew protection from possible shrapnel threats encountered in the event of RPG and ATGM attacks). The Project Implementation Schedule became effective as of June 13, 2017 and the deliveries were planned to be completed within 10 months (in April 2018). In April 2018 Undersecretary Prof. İsmail Demir announced with a tweet that under the M60T FIRAT Modernization Program delivery of the 90 40mm Automatic Grenade Launchers (AGL) had been completed. 40mm AGLs are integrated on SARP RCWSs and replaces the 12.7mm machine gun. Aselsan in cooperation with MKEK developed a 40mm smart grenade munitions with airburst function and performed firing tests in April 2018. Series production is expected to commence in June 2018. M60T FIRAT MBTs will be also integrated with the AKKOR PULAT Active Protection System (APS). Some of the modernized M60T FIRAT MBTs were deployed during Operation Olive Branch that was launched in January 20, 2018 against the YPG/PYD positions surrounding the Syrian city of Afrin.

The SSM gave instruction to start APS for M60T FIRAT MBTs on June 28, 2017, and in October 2017 Aselsan signed a cooperation agreement with Ukrainian SFTE Spets Techno Export (Microtech Base Center) company for ZASLON-L APS. It is believed that AKKOR PULAT developed by Aselsan in cooperation with TÜBiTAK-SAGE and during the development stage; Aselsan obtained some level of technical support from Ukraine. The AKKOR PULAT APS consists of Counter a Measure Module (Anti-Threat Ammunition and High Technology Triggering Radar), Power Distribution Unit and a Control Panel. AKKOR PULAT provides 360 degrees full protection, depending on the placement of the modules on the platform. There is a total of six (maximum eight to protect top of the turret against top attack mode ATGM threat) Counter Measure Modules on M60T FIRAT MBT and each covers a 60-degree range. AKKOR PULAT APS, detects the Anti-Tank Guided Missiles (ATGMs) or rockets (RPGs) approaching to the platform with its high technology triggering radar, and then disables them at optimum range from the platform by using the Hard-Kill method. According to the SSM firing tests with triggering radar were performed in February 2018 with successful results. Further live firing tests at the system level and on-board a M60T FIRAT MBT was scheduled to be performed in March 2018. During the Aselsan facility tour that took place on May 7, 2018

Aselsan Deputy General Manager Mustafa Kaval disclosed that they have received a follow-on order under the M60T FIRAT Modernization Program and live firing tests with AKKOR PULAT APS have been completed successfully. “Currently we are performing integration efforts, AKKOR PULAT will be on M60T FIRAT MBTs by the end of 2018 summer,” he said. According to MoND Nurettin Canikli, AKKOR APS would be able to perform ATGM intercept at 100m distances from the tank, whereas AKKOR PULAT is able to destroy RPG and ATGM threats at 8-10m distances.

According to Ukraine News Agency, the Turkish Government put out an urgent request for 120 complete Active Protection Systems to go on M60T and M60A3 and Leopard 2A4 MBTs, and Aselsan obtained a license from Ukraine’s Microtech to produce a version of their ZASLON-L system, which is called AKKOR PULAT in Turkey.

Roketsan and Aselsan were selected for the modernization of M60A3 MBTs. By undergoing modernization, it is aimed to increase the survivability, the firepower and the situational awareness of 40 M60A3 MBTs (sufficient to equip one tank battalion) in the Turkish Land Forces service. Dubbed as M60A3T1, the modernized M60A3 MBTs are integrated with a 12,7mm SARP RCWS, YAMGOZ Close-Range Surveillance System (360° Situational Awareness System), Tank Laser Warning Receiver System (TLUS), Smoke Grenade Launchers, Tank Driver Vision System (TDVS), Fire Extinguishing – Explosion Suppression System, Audible Warning System, Power Distribution Unit, Protective Coating and Increased Armor Protection (Roketsan’s add-on ERA armor modules and slat armor at the rear of turret). M60A3T1 MBTs will be also integrated with Aselsan’s AKKOR PULAT APS. Photos of the modernized M60A3T1 MBTs were posted on social media/twitter accounts in March 2018.

BMC (RBSS) was selected for the modernization of 81 Leopard 2A4 MBTs (sufficient to equip two tank battalions/one brigade) and a contract was signed in 2017 between the BMC/RBSS and SSM. According to BMC Land Platforms General Manager Bülent Santarcıoğlu, focusing mainly on armor and fire control system upgrade the Leopard 2A4 MBT modernization is based on Rheinmetall’s solution (probably based on Leopard 2 MBT Revolution upgrade) and currently being carried out at a facility allocated by the Turkish Land Forces Command. Modernized Leopard 2A4s will be also integrated with APS but it has not yet been disclosed whether the AKKOR PULAT of Aselsan or ADS-Gen3 APS of ADS GmbH, part of the Rheinmetall Group companies, has been preferred.

M60T “FIRAT” Tank was retrofitted by Aselsan’s Systems

As the leading defense company for MBT modernization in Turkey, Aselsan has previously played important roles in the major MBT (171 Leopard 1A1/A4 and 170 M60A1) and APC (provides un-cooled thermal cameras for ACV-15 AAPCs and BTR60 APCs) modernization programs of the Turkish Armed Forces (TAF) and has also developed an indigenous fire control system for the T-155 FIRTINA-I and FIRTINA-II Self Propelled Howitzers (SPH) of the Turkish Army. The Turkish Army procured a total of 339 (298+41) Leopard 2A4s (+15 for spare parts) from the German Army surplus and one of them was upgraded by Aselsan under a contract awarded in April 2010 by the SSM. After modernization the tank was dubbed as the Leopard 2NG (Next Generation).

Under the US$687.5 Million contract awarded in March 2002 to IMI of Israel, 170 M60A1 MBTs of the Turkish Army were modernized with the participation of local companies. A prototype tank was modernized in IMI facilities and the remaining 169 tanks at the 2nd Main Maintenance Center (MMC) in Kayseri. The deliveries of the modernized tanks, dubbed as M60T, were completed in April 2010. Under the project, 120mm smooth bore Main Gun System (MG253) and 120mm KE ammunition were produced at MKEK facilities (under IMI license), Fire Control System and Electrical Gun and Turret Drive System were delivered by Aselsan (under El-Op/Elbit license) and the fire extinguishing and explosion suppression system produced locally under license by Forum AŞ.

Leopard 2 MBT Revolution with ADS-Gen3 APS

New Generation FIRTINA (FIRTINA-II) SPH

Serial production of the first batch the New Generation T-155 FIRTINA (FIRTINA-II) Self Propelled Howitzers (SPH) will be commenced in 2018. According to the Aselsan 2017 Activity Report, the first phase of Qualification Tests with FIRTINA-II prototype was carried out in 2017. Speaking at the Aselsan facility tour that took place on May 7, 2018 Aselsan Deputy General Manager Mustafa Kaval underlined that FIRTINA-II SPH is a totally national platform, because some of the subsystems that used on FIRTINA-I were procured from abroad/ foreign companies but all of them have been replaced with indigenous/local units on FIRTINA-II SPH.

Developed over existing FIRTINA-I SPH, the FIRTINA-II SPH features some improvements over its predecessor including new turret design with ammunition climatization/ conditioning sections, fully electrical and servo controlled turret drive system (replacing hydraulics based drive system), improved Fire Control System, increased firing rate (current version able to fire 3 rounds in 15 seconds, this rate has been shortened in FIRTINA-II), extended effective range, fully automatic ammunition loading system (FIRTINA-I is equipped with electrically driven and electronically controlled automatic ammunition loading system) and integrated with Aselsan's 12,7mm SARP RCWS for self-protection. Some of the existing FIRTINA-I SPHs are also expected to be upgraded to the FIRTINA-II level.

The 155mm, 52 caliber FIRTINA-I SPH is one of the best of its category with outstanding features such as improved digital fire control system, capability of digital integration to the upper Fire Control Centers. During 2004-2014 1st Main Maintenance Center (MMC), situated in Arifiye, Adapazarı with support of other local companies manufactured a total of 281 FIRTINA-I SPH for the Turkish Land Forces Command. The 155/52-calibre gun and some subsystems and equipment used on the first 60 FIRTINA-I SPHs were procured directly from South Korea. Under the program MKEK delivered the complete 155/52-calibre weapon system, Aselsan delivered the Fire Control System (FCS) and the 1st MMC manufactured the platform, turret and some subsystems.

Operated by a crew of five, the 155/52 caliber T-155 FIRTINA-I SPH has a maximum firing rate of up to six to eight rounds per minute thanks to its automatic shell loading system. The maximum range of the 155/52-calibre gun is 18km with M107 (HE), 30km with M549A1 RAP (HE) and 40+km with MKEK/Roketsan MOD 274 HE ER ammunition. In order to meet the Turkish Army's long range, HE type artillery munitions requirement MKEK, in cooperation with Roketsan (responsible for the base bleed unit of the ammunition), has developed MOD 274 HE extended range (ER) 15mm 52 caliber artillery ammunition and received a contract for the delivery of first batch of 5.020 MOD 274 ammunitions at the end of 2014. In 2017 follow on orders for an additional 9.000 (2.000 + 7.000) MOD 274 HE artillery ammunition were awarded.

The T-155 FIRTINA-I SPH is powered by a German MTU-881 KA 500 1.000hp diesel engine coupled with Allison's X1100-5 fully automatic transmission.

Using same chassis and turret with T-155 FIRTINA-I SPH, the POYRAZ Ammunition Resupply Vehicle is capable of loading ammunition in the supply area and transferring ammunition to the FIRTINA-I SPH within the required time and location in all kind of terrains and battlefields. The POYRAZ Ammunition Resupply Vehicle has the necessary mobility and survivability capabilities for operation within the tactical operational environment of FIRTINA-I SPH. Fitted with Aselsan's automatic Ammunition Transfer System, compatible with all kinds of ammunition used for FIRTINA-I SPHs, the POYRAZ vehicle can carry 96 155mm artillery projectile and 96 modular power charges. It can transfer 48 projectiles and 48 modular powder charges in less than 20 minutes to the FIRTINA-I SPH.

The 1st MMC completed production of the POYRAZ Ammunition Resupply Vehicle prototype in 2011 and the vehicle was displayed during the IDEF '11 Fair. Following the extensive test campaign acceptance of the prototype vehicle completed and the serial production phase, covering 70 vehicles, was commenced in 2013. The vehicle is 9,5m long, with a height of 3,76m and weighs 47 ton. The POYRAZ Ammunition Resupply Vehicle is operated by three crew members and powered by a V-12 type 750hp AVDS-1790 diesel engine coupled with an Allison CD-850 automatic transmission. This power pack was obtained from M48A5T1 MBTs that were taken out of service in the Turkish Army.

FIRTINA- 2 SPH

Weapon Carrier/Anti-Tank Vehicle (WCV) Program

Under the Weapon Carrier/Anti-Tank Vehicle (WCV) Program, a total of 260 wheeled and tracked type anti-tank vehicles to be integrated with Remotely Operated Anti-Tank Turret, will be indigenously developed in order to carry the new generation KORNET-E Anti-Tank Guided Missile Systems (ATGM) currently in service of the Turkish Land Forces Command (TLFC) and also for those to be acquired by the SSM under the MIZRAK-O/OMTAS Project.

The program was launched in April 2013 and on June 21, 2013 the SSM issued an RFP document to FNSS and Otokar to procure 184 tracked and 76 wheeled Weapon Carrier/Anti-Tank Vehicles. Following the evaluation of the proposals, Defense Industry Executive Committee (DIEC) decided to initiate contract negotiations with FNSS, and contract was signed on June 27th, 2016. Under the contract, FNSS will deliver 184 WCVs based on KAPLAN-10 tracked type armored vehicle and 76 WCVs based on PARS 4x4 Wheeled Armored Vehicle (WAV). Under the contract, which became effective on October 14, 2017, FNSS will deliver 184 WCVs based on KAPLAN-10 tracked type armored vehicles and 76 WCVs based on PARS 4x4 Wheeled Type Armored Vehicle (WAV).

80 of the 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.

Under the contract, the System Requirement Review Meeting and Preliminary Design Review Meetings were held, and the Critical Design stage was completed in 2017. Following the 15-month effort FNSS completed the manufacture of the KAPLAN-10 prototype in January 2018 and started Verification and Qualification Tests in March. The production of the prototype of PARS 4x4 WCV was completed in April 2018 and to Qualification Test have been launched in May 2018. Series production will start following the completion of Qualification Tests and establishment of the production line. Deliveries for KAPLAN-10 WCVs and PARS 4x4 WCVs will be launched in 2019 and will be completed in 2021.

FNSS KAPLAN -10 Tracked Weapon Carrier Vehicle

Both the KAPLAN-10 and PARS 4x4 WCVs will have amphibious capabilities and are to be fitted with unmanned, Remotely Operated Anti-Tank Turret carrying just two (four was planned in the beginning) KORNET-E or MIZRAK-O/OMTAS ATGMs and a 7,62x51mm machine gun.

The 15-ton class KAPLAN-10 Light Armored Weapon Carrier has twin 5 road wheeled tracks, has the ability operate in hot/cold weather conditions at high speed not only on asphalt and stabilized highways, but also in soft soil, muddy and rough terrains. The advanced suspension system, tracks have been designed to reduce vibration and increase road holding. While the power pack cabin and the expanded driver area are located in front of the vehicle, the gunner and the commander areas are located in the middle of the vehicle. KAPLAN-10 will be operated by 5 crew and will provide diversified level NATO STANAG ballistic protection and mine protection against mines and IEDs to the crew.

As the last member of the PARS WAV Family, the PARS 4x4 with its 5 crew can operate in water that is deep and fast moving without any preparation. Powered by a diesel engine, coupled with fully automatic transmission, with a length of 5m and a height of 1,9m and a width of 2,5 m PARS 4x4 can reach 120km/h on the road and can swim at speed of 8km/h with 2 water jets. The vehicle can switch from a 4x4 mode for rough terrain to a 4x2 mode for use on highway. Having a power to weight ratio of 25-30hp/tons the PARS 4x4 can operate on any rough terrain with a reduced break angle, low center of gravity, fully independent suspension system, ABS-assisted hydraulic disc brakes, low ground pressure and increased angles of approach and departure.


PARS 4X4 WCV

Special Purpose Tactical Wheeled Armored Vehicles (SPTWAV) Program

Meeting the Turkish Armed Forces' wheeled armored vehicles requirement from local sources since late 1980s, the SSM launched the Special Purpose Tactical Wheeled Armored Vehicle (SPTWAV) and the Weapon Carrier/Anti-Tank Vehicle (WCV) Programs in November 2006, to meet the respective requirements of the Program of the Turkish Land Forces Command. The SPTWAV Program covers the procurement of 472 tactical wheeled armored vehicles both in 6x6 (in two configurations) and 8x8 (in two configurations) versions and related mission equipment for tactical reconnaissance, surveillance and CBRN (Chemical, Biological, Radiological and Nuclear) reconnaissance missions of the Turkish Land Forces. Under the program 121 Command Vehicles (in 6x6 configuration to be equipped with a 25mm turret), 217 Sensor/ Reconnaissance Vehicles (in 8x8 configuration to be equipped with pintle mounted gun and a Mast with EO sensors), 74 Radar Vehicles (in 6x6 configuration to be equipped with mast mounted surveillance radar), and 60 CBRN Reconnaissance Vehicles (in 8x8 configuration to be equipped with 12.7mm RCWS and CBRN sensors) will be procured from a local supplier. On September 5th, 2014 the RFP document was issued by the SSM to the local companies and requested to submit their proposals by December 1st, 2014 and this deadline was later extended to February 27, 2015. However, proposal delivery deadline was extended once again and finally bidders submitted their first proposals during the second half of 2015 and their revised proposals during the second half of 2016. In late 2016 bidders were asked to submit their Best and Final Offers (BAFOs). The tender process was completed in early 2017. However, bidders have asked to revise their proposal to meet the indigenous power pack (engine and transmission) requirement. Following the four to five months of studies bidders submitted their revised proposal once again to the SSM during the second half of 2017.

Within the scope of the SPTWAV Program, the SSM aimed to award contract during the first quarter of 2018. The SPTWAV Program was on the agenda of the January 31, 2018 DIEC meeting, however there was no reference to the SPTWAV Program at the official announcement. According to sources the number of vehicles to be procured under the SPTWAV Program was decreased so a new tender process is expected.

KORKUT SPAAG and FNSS ACV-30

KORKUT Self Propelled Anti-Aircraft Gun (SPAAG) System project covers the procurement of 42 Weapon System Vehicles (SSA, will replace existing aged M-42A1/ A2 Duster Walker systems) and 14 Command and Control Vehicles (KKA) all based on the FNSS ACV-30 Armored Combat Vehicle (ACV) chassis. On June 25, 2011, Aselsan, the Main Contractor of the SPAAG System program, awarded a Tracked Carrier Vehicle Development Contract to FNSS for the design, development and production of one Command and Control Vehicle chassis and two Weapon System Vehicle chassis prototypes to be based on the ACV-30 in two years.

After an extensive mobility and firing test campaign that was launched in 2015 and carried out with the participation of the SSM and Turkish Army representatives, acceptance of these vehicles were carried out on in 2016 and KORKUT SPAAG prototypes (2x Weapon System Vehicles and 1 Command & Control Vehicle) entered the service of the Turkish Army. Following the successful completion of the prototype development and qualification phase KORKUT SPAAG Series Production Phase, covering the production and delivery of 40 SSAs and 13 KKAs was launched with a contract signed between the SSM and Aselsan in May 2016. Aselsan then signed a contract with FNSS to procure a total of 53 ACV-30 tracked vehicles. Under the contract FNSS will deliver the first batch of ACV-30 chassis in May 2018 to Aselsan, who will then convert them into KKA and SSA configurations.

ACV-30 platform chassis is provided with a unique, space laminated armor system combining steel and aluminum technology for a protection against firing of small arms and mine blasts. Powered by a 600hp diesel engine, coupled with a fully automatic transmission, with a length of 7,07m and an overall height of 3,62m the 3,9m wide ACV-30 can reach 65km/h on the road and can swim at a speed of 6km/h with 2 water jets. Having a combat weight of 29,5 tons the ACV-30 has a cruising range of 500km.

ZAHA Program

On March 7, 2017 the Armored Amphibious Assault Vehicle (ZAHA/ AAAV) Program contract was signed between the SSM and FNSS. Under the contract the ZAHA will be developed and produced by FNSS based on an indigenous development model. FNSS will deliver a total of 27 vehicles, including 23 personnel carriers, 2 in command and control vehicle and 2 in recovery vehicle configurations. The technical characteristics of the ZAHAs were determined by taking into consideration the operational concept and mission requirements defined by the Turkish Naval Forces Command.

KORKUT Self Propelled Anti-Aircraft Gun (SPAAG) System

The ZAHA/AAAVs will be able to carry 21 fully equipped infantries as well as 3 crew. They will have ballistic and mine protection at a certain level and will be able to move rapidly in water and on land. They will have the capabilities of firing at targets with their unmanned turret with a 12.7mm Machine Gun (MG) and a 40mm Automatic Grenade Launcher (AGL) and perform operations at various sea levels.

Compared to similar examples, these vehicles are expected to be superior in the following respects: Number of personnel transported by the vehicle, Level of ballistic and mine protection and performance on land and in water. The ZAHAs will be deployed on the TCG Anadolu LHD vessel (to be based on Juan Carlos I LHD design and under construction at SEDEF Shipyard in Tuzla, Istanbul) of the Turkish Navy.

In addition to enabling the safe landing of units during landing operations, ZAHAs also serve as armored combat vehicles or armored personnel carriers after reaching the shore. During the landing phase of an operation, these vehicles are launched from the LHD (landing helicopter dock) approaching the coast, and rapidly cover the distance of several kilometers in between, allowing units to land with minimum delay. Once on land, they can continue taking part in operations side by side with other armored vehicles.

Powered by a diesel engine, coupled with fully automatic transmission, with a length of 8,3m and a width of 3,3m the ZAHA can swim at a speed of 7km/h with 2 water jets. With a combat weight of 30 tons the ZAHA will have a 21-troop capacity in addition to the three-man crew (driver, commander and gunner). To be integrated with a remotely operated turret armed with a 12,7mm machine gun and a 40mm automatic grenade launcher the ZAHA can operate at various sea state in 4 conditions. The ZAHA will be able to negotiate up to 40% side slopes and 60% gradient and could cross natural or man-made obstacles up to 90cm high, and trenches 2m wide.

Modern Medium Weight Tank (MMWT) Program

The Indonesian Modern Medium Weight Tank (MMWT) Program stands out, as it is the first Government-to-Government (G2G) cooperation project in the Turkish Land Platforms/Systems Sector. During Indo Defense 2014 Fair, the Indonesian Ministry of Defense (MoD) and the Un¬dersecretariat for Defense Industries (UDI/SSM) of the Turkish Ministry of National Defense (MoND) signed a Memorandum of Understanding (MoU) on November 7, 2014 to establish a G2G development program for a medium weight tank, under the sponsorship of the two sides, to meet Indonesian Army requirement. FNSS Defense Systems and Indonesia's state-owned company PT PINDAD teamed up as the industrial partners of the MMWT Program and the development work started in 2015. The cooperation agreement between FNSS and PT PINDAD covers the design, development, manufacture, testing and qualification of two MMWT prototypes.

The conceptual design of MMWT was completed and revealed during Indo Defense 2016 Fair held in Jakarta, Indonesia in November 2016. The first prototype developed and manufactured by FNSS in Ankara, Turkey is currently undergoing qualification trials in Indonesia, which was unveiled at the IDEF '17 Exhibition in Istanbul and also participated in the Army Day Parade in Indonesia on October 5, 2017. PT PINDAD engineers, who have been trained in the engineer¬ing development and manufacture phases of the first prototype at FNSS, recently completed the production of the second prototype in Indonesia with support from FNSS. The qualification of the two MMWT prototypes as well as firing trials and durability tests are expected to be completed by the third quarter of 2018 (July 2018). FNSS and PT PINDAD have already initiated negoti¬ations towards the serial production of the MMWT platforms, which the Indonesian Government indicates a keen interest in.

Within the scope of the MMWT Program, diverse cooperation project models such as technology transfer, local production, and joint production were also carried out. Turkey and Indonesia established a long-lasting cooperation in the land vehicles sector with the MMWT Program. Both parties benefited from the mutual transfer of experiences, and the fact that the project was completed in accordance with the planned schedule is an indicator of the harmony between the countries and the companies.

Based on the FNSS KAPLAN-30 chassis and dubbed as 'Black Tiger' by Indonesia, the MMWT design comprises advanced ballistic and mine protection with a broad range of firepower, from close support of infantry to anti-armor. MMWT's precision direct fire capability ensures required lethality with an outstanding tactical and strategic mobility. Rear configuration power pack of the


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vehicle is combined with advanced electronic controlled systems and heavy-duty suspension system. The vehicle's new generation engine supplies adequate power, coupled with a fully automatic electronic controlled transmission, which results in a minimum of 20hp/ton ratio, depending on the configurable protection system. MMWT gets its advanced mobility capability from a 6-wheeled suspension system built on torsion bars with double pinned tracks.

The MMWT tank is fitted with CMI's Cockerill 3105 (CT-CV 105HP) turret armed with a high-pressure 105mm L-53 CV rifled gun and a coaxial 7,62mm machine gun and for ease of deployment in jungles/ tropical forests and soft grounds of Indonesia the vehicle has a combat weight of 35 tons. Since the main gun uses an autoloader (with 12 rounds ready to fire) the MMWT has a three-man crew. With a length of 7m, a width of 3,2mand a height of 2.7m the MMWT has a top speed of 70km/h on roads and a cruising range of 450km, with on-board fuel. In order to have a minimum power to weight ratio of 20hp/tons the MMWT is believed to be powered by a 700hp class power pack. The MMWT is planned to be ready for Series Production in 2019. The initial order is expected to cover 100 MMWTs but in the medium term, the demand for the vehicle is expected to increase to as many as 300.

KIRPI Mine Resistant Ambush Protected Vehicle

Speaking at the SAVTEK 2018 Conference held at Istanbul Technical University (ITU) on May 7, 2018 BMC Land Platforms General Manager Bülent Santarcıoğlu underlined that since 2011, BMC has completed delivery of 1,433 KIRPI-I and KIRPI-II Mine Resistant Ambush Protected Vehicles to the Turkish end users and as of May 2018 in a large number of these vehicles have been deployed in Syria (Afrin). Meanwhile, under the Flexible Layered Cage Armor System Project as of April 2018, 160 KIRPI-I MRAPS have been equipped with Flexible Layered Cage Armor System.

To meet Turkish Land Forces' 468, Mine Resistant Ambush Protected Vehicle requirement under the Tactical Wheeled Vehicle-I (TTA-I) Project SSM selected BMC 350-16Z, based on Hatehof's Navigator 4x4 armored vehicle and awarded a contract valued at €115.560 Million to BMC in April 2009. According to the contract the first batch of vehicles should be delivered in August 2010 and the final batch should be by the end of 2012. However, due to financial problems BMC failed to meet its contractual obligations and deliveries could only be launched in February 2011. Deliveries of the BMC 350-16Z vehicle, dubbed as KIRPI (Hedgehog) by the Turkish Army, stalled in 2012 due to BMC's financial problems and until March 2013 only 293 KIRPIs had been delivered.

Since BMC failed to fulfil the contractual terms due to financial difficulties the contract was terminated by the SSM in 2013. Meanwhile Turkey's state-owned Savings Deposit Insurance Fund (TMSF) confiscated the assets of BMC in May 2013 in return for company's outstanding debts after it went bankrupt. TMSF announced in February 2014 that BMC would be put up for sale at an estimated value of TL985 Million. At the end of sale process ES Mali Yatırım (ES Financial Investment) of Ethem Sancak's, purchased the company. TMSF approved the sale of BMC to a local finance house ES Mali Yatırım (ES Financial Investment) in May 2014 and on June 2, 2014 ES Mali Yatırım asked the Competition Authority for permission to allow the Qatar Armed Forces Industry Committee (AFIC) to invest in the company in order to resume production. AFIC acquired a 49% share of BMC from ES Mali Yatırım. Now a 49% share of BMC is owned by AFIC, 25+1 share is owned by Talip Öztürk and a 25% share is owned by Ethem Sancak.

Meanwhile the Turkish MoND signed a follow-on contract with TMSF on October 24, 2013 for the procurement of 321 KIRPI Mine Resistant Ambush Protected Vehicles. Soon after resuming its production BMC delivered the first batch of 20 KIRPI vehicles to the Tunisian Ministry of National Defense (MoND). In late 2013, the Tunisian MoD awarded an undisclosed value of contract to BMC for the procurement of 40 BMC 350-16Z KIRPI MRAPs. Deliveries were completed in two batches during 2014. The first batch of 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 a further 101 KIRPI MRAPs in various configurations including 4 Ambulance vehicles. Some of the vehicles are equipped with the passive RPG protection system (AmSafe Bridport's TARIAN). BMC also secured orders to deliver 40 KIRPI MRAPS to Qatar (all of them to be equipped a Dodaam RCWS) and 100 KIRPI MRAPs in various configurations (including 10 Ambulance vehicles) to Turkmenistan.

In a large number of KIRPI MRAPs were deployed in cross-border operations

BMC re-launched KIRPI deliveries to the TLF in March 2014. According to the SSM 2014 Activity Report total value of 614 (293+321) KİRPİ-I MRAPs, that were procured for the Turkish Army under the Tactical Wheeled Vehicle-I (TTA-I) Project from BMC, is €151,439 Million. Turkish Army is not the sole user for KIRPI vehicles in Turkey, Gendarmerie General Command (over 300 vehicles) and Security General Directorate (SGD/ Turkish National Police, over 200 vehicles); also have KIRPI MRAPS in their inventories. To meet Turkish end users (including Turkish Army, Gendarmerie General Command and Security General Directorate) further KIRPI MRAP requirement the SSM awarded a contract to BMC under the Tactical Wheeled Vehicle-II (TTA-II) Project on August 8, 2017 for the procurement of 529 New Generation KIRPI (KIRPI-II) MRAPs. Deliveries of the KIRPI-II MRAPs commenced in 2017 and is expected to be completed in 2018. Compared to KIRPI-I (fitted with leaf spring suspension system), KIRPI-II has an independent suspension system and also features composite armor, manufactured by a local company.

Some of the KIRPI-I and KIRPI-II MRAPS in Turkish Army, Gendarmerie General Command (GGC) and Security General Directorate (SGD) services are integrated with Aselsan's SARP 12.7mm and Dual SARP (can be armed with 7.62mm and 12,7mm machine guns and a 40mm automatic grenade launcher) RCWSs.

On April 5, 2017 Aselsan disclosed that they have secured a contract worth €37 Million (TL145 Million) from BMC for the delivery of an undisclosed number of SARP-Dual RCWSs. Deliveries were completed in 2017. In October 2017 Aselsan disclosed that they have secured a contract worth €27.7 Million from BMC for the delivery of undisclosed number of SARP-Dual RCWSs. In January 2018 Aselsan secured a new contract from BMC valued at €76.81 Million for the delivery of undisclosed number of SARP RCWs in 2018. During an 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.

KIRPI-II New Generation MRAP was displayed at DIMDEX 2018 with Aselsan's SARP RCWS and "Yankı" Gunshot Detection System

Powered by an 8.9 liter, 375hp (previous batch vehicles in Turkish Army, GGC and Tunisian Army services are powered by 350hp version of the same engine) Cummins ISL9E3+375 turbo diesel engine. The KIRPI has a 13-troop capacity including the three-man crew (driver, commander and gunner). With a combat weight of 19,910kg KIRPI-I/II 4x4 featuring STANAG 4569 Level 4 mine and Level 3 ballistic protections. KIRPI could fold 80cm (120cm optional) of water, negotiating 30° side slopes and a gradient of 60%.

BMC showcased the 6x6 configuration of the vehicle for the first time at Eurosatory 2012. Thanks to its higher payload capacity KIRPI 6x6 could be equipped with mine plough and mine detection equipment for mine clearance applications and a RCWS. Though the vehicle's length has been extended its personnel capacity is still 13 (can be increased to 15 with the addition of two seats). With a combat weight of 23 tons KIRPI 6x6 shares a similar power pack with its sisters KIRPI-I/II 4x4.

Meanwhile, BMC secured a contract to deliver 50 KIRPI-II MRAPs and 35 AMAZON 4x4 Multipurpose WAVs to Qatar during the Doha International Maritime Defense 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 also secured a contract from the SSM to deliver an undisclosed number of AMAZON 4x4 Light Armored WAVs to SGD and 700 VURAN WAVs to GGC including an undisclosed number of 120mm Automatic Mortar Vehicles (dubbed as FATİH). Under the contract VURAN 4x4 WAVs deliveries to GGC started in 2018 and the first batch of FATİH Automatic Mortar Vehicles are expected to enter GGC service during the summer of 2018. The FATİH Automatic Mortar Vehicle is equipped with Aselsan's ALKAR AKS-120 automatic mortar system. Revealed during the IDEF '17 Fair and having performed live firing tests in December 2017, the Aselsan ALKAR is a turret for launching 120mm mortar from mobile carriers or from fixed positions. The ALKAR turret can rotate 360 degrees and operate in day or night, all terrains and weather conditions.

PARS-II/AV-8 Gempita ACV Program

Under the contract valued at US$559 Million and awarded in February 2011, in cooperation with DRB-HICoM DEFTECH of Malaysia FNSS will design, develop and produce a total of 257 armored personnel carriers to be based on PARS-II 8x8 in 12 different configurations including; the infantry fighting vehicle (IFV), armored fighting vehicle (AFV), the armored personnel carrier (APC), tank destroyer (AFV-ATGW), command vehicles (ACV), signals (AVS), reconnaissance vehicle as well as recovery vehicle. While the original PARS 8x8 was a 24-25-ton vehicle, the AV-8 IFV-25 configuration weighs 28 tons and its equipment differs considerably from that of PARS. Deliveries will span over 7 years and are planned to be completed by 2020. Malaysia is said to be considering placing an order for the second and third batches of AV-8 vehicles. The second batch is expected to be on the agenda around 2021-2022.

On December 6, 2014 the Malaysian Army received the delivery of the first 12 of 257 AV-8 Gempita Armored Combat Vehicles (ACVs). The then Malaysian Army Chief General Raja Mohamed Affandi Bin Raja Mohamed NOOR accepted the first batch of 12 vehicles, all of which are in the IFV-25 configuration. During a ceremony witnessed by the then Prime Minister Najib Tun Razak, formally named the vehicle 'the Gempita', which is a Malay term for 'thunderous noise'. The IFV-25 configuration of the AV-8 ACV is fitted with a one-person FNSS Sharpshooter turret armed with a stabilized ATK Armament Systems M242 25 mm dual-feed gun and an FN MAG 58M 7.62 mm co-axial machine gun. 46 of the 257 AV-8 vehicles will be delivered in IFV-25 configuration. Weapons systems capabilities of the AV-8 Gempita includes; 25mm gun, specially designed two-man turret with 30mm gun, 12.7mm RCWS as well as an Anti-Tank Guided Weapon (ATGW).

The first 12 platforms have been delivered by FNSS, after which the program continues with the delivery of knockdown kits. DEFTECH engineers have participated in the design and devel¬opment of the AV-8 vehicle at the Gölbaşı Facilities of FNSS for a period of two years. Under the AV-8 Gempita Program, as of May 2018, 122 vehicles in 7 variants have been delivered so far to the Malaysian Land Forces and the project is expected to be completed by 2020. Four of the variants are in the development and testing phase with the remaining one in the configuration finalization stage.

RAO PARS-III 8x8/6x6 WAV Program

The official delivery of the first PARS-III Wheeled Armored Vehicle (WAV) to the Royal Army of Oman (RAO) took place on July 12th, 2017 at the FNSS facilities located in Gölbaşı, Ankara/Turkey. Painted in the camouflage used by the RAO the first PARS-III WAV, with a hull number of 001, is in an 8x8 configuration and Armored Personnel Carrier (APC) variant. Also dubbed as IFV-25 variant the PARS III 8x8 APC is fitted with a one-person FNSS SABER 25 turret armed with a stabilized ATK Armament Systems M242 25mm dual-feed cannon and an FN MAG 58M 7.62 mm co-axial machine gun.

Following trials that lasted three years (PARS 8x8 performed country trials in Sultanate of Oman in summer 2012), tests and the proposal evaluation period under the RAO WAV Program during the second half of 2015 FNSS received a contract of approximately US$500 Million from RAO and the Ministry of Defense 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 WAVs in 13 variants and the contract became effective on September 20, 2015. The contract period will 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. 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.

Contrary to Malaysian AV8 Gempita (Thunder) Program covering the delivery of a total of 257 8x8 WAVs, which is based on PARS II, to Malaysian Armed Forces in cooperation with local partner DRB-HICoM DefTech, which acts as the principal assembly agent and works with FNSS to customize the vehicles for Malaysian requirements and equipment, all of the RAO PARS-III WAVs will be manufactured and assembled at FNSS facilities in Ankara, Turkey. The 172 PARS-III WAVs include 145 8x8 in 8 variants and 27 6x6 vehicles in 5 variants. The 145 PARS-III 8x8 WAVs include; 72 units in Armored Personnel Carrier Vehicles (APC, IFV-25 variant) configuration, 22 in Armored Main Command Vehicles, 16 Armored Specialized Command Vehicle, 12 in the 120mm Armored Mortar Vehicle, 8 in the Armored Ambulance Vehicle, 8 in the Armored Recovery Vehicle, 6 in the Armored Field Engineer Vehicle and 1 in the Armored Training Vehicle variant. The 27 PARS III 6x6 WAVs include; 12 in

PARS III 8X8 WAV

the Armored Reconnaissance Vehicle configuration, 6 in the Mortar Fire Controller Vehicle, 4 in the Armored Radio Relay Vehicle variant, 4 in the Armored Specialized Command Vehicle and 1 in the Armored Training Vehicle.

Under the Program, Common Base Vehicle Concept Design was approved in May 2016 and the production of the first vehicle (PARS-III 8x8 APC with hull number 001) started in August 2016. Initial Inspection of the first vehicle (PARS III 8x8 APC) was held between June 5th-16th, 2017 in Turkey. Durability Test and Final Acceptance of the first 8x8 vehicle was conducted in Oman. As part of Acceptance Tests, PARS-III 8x8 APC underwent live firing test in November 2017 at Safrat Al Dooh firing range. The second vehicle of the Program is an Armored Reconnaissance Vehicle and is in 6x6 configuration.

Currently in the third year of the program, after completing a challenging durability qualification of the first vehicle, as of May 2018, 8 PARS-III vehicles have been delivered to the ROA as a first batch, where a total of 48 platforms are expected to be delivered by the end of 2018. The start of PARS-III deliveries to ROA also has a positive impact on Turkey's defense exports to Oman. According to the Turkish Exporters' Assembly (TIM) figures, during January 1st – April 30th, 2018 Turkey exported around US$70,724,740 Million worth of defense and aerospace equipment to OMAN, during January 1st – March 31st, 2018 this figure was at the level of US$21,741 Million.

Together with these vehicles FNSS will also provide extensive Integrated Logistic Support (ILS) and deliverables within this Program, including two years of free maintenance under warranty and four years of additional support. The Long-Term Support for the PARS III WAVs will last 20 years after warranty.

The PARS-III 8x8 is powered by a German Deutz turbocharged, water-cooled diesel engine, developing 550hp coupled to a fully automatic transmission with 7 forward and 1 reverse gear. Meanwhile, the power pack of the PARS III 6x6 consists of a water-cooled turbocharged diesel engine with an output power of 483hp and a fully automatic transmission with 7 forward and 1 reverse gears. The diesel power pack is mounted to the rear of the driver on the left side of the hull, between the first and second axles. The power pack architecture, which allows disassembly and reassembly in less than 60 minutes, allows the user to replace the engine in the field as an additional benefit.

The hull of the PARS-III consists of a composite aluminum and steel armor that provides a protection for the crew and infantry against firing of small arms 7.62mm armor-piercing attack through a full 360 degrees. The PARS-III is more protected than the basic PARS 8x8 with additional armor mounted at the front and to the sides of the hull. FNSS claims that the hull design of the PARS-III offers a higher level of ballistic and mine protection compared to PARS-I and PARS-II/AV-8 ACVs. The PARS-III WAV is fitted with an NBC protection (face mask protection system and positive pressure system depending the variant) system for defense against nuclear, biological, chemical threats and the survivability is further enhanced by smoke grenade launchers located on both sides of the vehicle and on the SABER 25 turret. With a combat weight of 1.800kg the SABER 25 turret features a digital fire control and sighting system includes a 3rd Generation Long Wave [8-12 µm] or Mid Wave [3-5 µm] Thermal Imager, a telescopic day optical channel, unity window for surveillance, and an eye safe Laser Range Finder with 8.000m range and ballistic computation capability. The gunner is also provided with two up-look periscopes for all around vision. The gun turret drive system is electrical and fully digital with two-axis stabilization capability to ensure a high accuracy of fire on the move. The main armament consists of a M242 25mm dual-feed automatic cannon with 240 [150 HE / 90 AP] ready to fire rounds. The secondary armament is a 7.62mm coaxial machine gun with 600 ready-to-fire rounds. According to FNSS, thanks to 3rd Generation digital fire control and sighting system the first vehicle PARS-III 8x8 APC has performed very precise firings with SABER 25 turret during Initial Inspection held in June 2017 even at firing tests performed at 3km distance to a fixed target.

While the PARS-III 8x8 APC and 6x6 Armored Reconnaissance Vehicle, Armored Specialized Command Vehicle and APC variants are fitted with a SABER 25 turret, 8x8 Armored Specialized Command Vehicles will be fitted with 12.7mm Remote Weapon Station. The 7.62mm and 12.7mm Nimer Cupola, being manufactured locally by an Omani manufacturer in Oman, will be integrated on the remaining PARS-III 8x8 and 6x6 variants, excluding the 8x8 120mm Armored Mortar Vehicle to be fitted with a 120mm Ruag Defense's smooth bore mortar system and 7.62mm pintle mount as a secondary weapon.

RABDAN 8X8 AACV

RABDAN 8x8 AACV

In March 2017 Turkey's largest private defense industry company Otokar won a deal worth US$661 Million to manufacture 400 'RABDAN' 8x8 Amphibious Armored Combat Vehicles (based on ARMA 8x8 and fitted with BMP-3 ACV turret) for the United Arab Emirates (UAE) Land Forces. The 'RABDAN' contract represents the largest ever defense system export in a single project achieved to date by a Turkish defense company.

Otokar established a Joint Venture company with Tawazun in the UAE called Al-Jasoor to build RABDAN 8x8 Amphibious Armored Combat Vehicles (AACVs) at the Tawazun Industrial Park manufacturing facilities in Abu Dhabi. Commenting about the contract Otokar General Manger Serdar Görgüç underlined that this program was one of the largest armored vehicle procurements in the world and the number of vehicles to be manufactured under the program shall reach to 700's in the coming period.

According first specifications released by the UAE Company Al Jasoor Heavy Vehicles Industries, the RABDAN has the capacity to carry a total 12 personnel including driver and commander. It has gross vehicle weight (GVW) from 28,000 kg to 30,000 kg. The RABDAN is powered with Caterpillar 12.5 liter diesel engine developing 600hp coupled to an Allison 4500 automatic transmission with 6 forward and 1 reverse gear. The RABDAN has a top speed of 105km/h and a cruising range of 700 km. The RABDAN offers ballistic protection up to STANAG Level 4 and mine protection up to STANAG Level 4a/b. The vehicle is fully amphibious and propelled in the water at a maximum speed of 10km/h thanks to two propellers mounted under the hull rear. The 8x8 vehicle is fitted with a two-man BMP-3 turret, which is armed one 100mm 2A70 semi-automatic rifled gun/missile launcher as main armament and one 30 mm 2A72 coaxial cannon and one 7.62 mm PKT coaxial machine gun as second armament.

Anti-Riot Vehicle (TOMA)

Nurol Makina ve Sanayi (NMS), Katmerciler and BMC, are leading suppliers for the Anti-Riot Vehicles (TOMA) to the Turkish Army, Turkish National Police (Security General Directorate/SGD) and Gendarmerie General Command (GGC). TOMA vehicles have proven their excellence since their first introduction to local and international markets in 2002. According to Turkish Minister of Interior Süleyman Soylu, as of May 2018 there are 765 TOMA vehicles in different configurations in the services of the SGD (over 500) and the GGC.

Manufacturing TOMAs since 2010 Katmerciler claims that they have a 75% share in the Turkish TOMA market. Manufacturing TOMAs since 2002 NMS delivered over 200 TOMA vehicles to the SGD and GGC in Turkey and several police departments in export markets. NMS also exported 20 TOMA Riot Control Vehicles to Libya under a contract awarded by the Turkish Government to meet a Libyan Ministry of Interior requirement. Vehicles were delivered in three batches to Libya during 2013. In August 2015 NMS delivered an undisclosed number of EJDER TOMA to its first export customer, the Republic of Congo. NMS also exported four EJDER TOMAs to Senegal and participated in an Independence Day military parade together with 25 EJDER YALÇIN WAVs in April 2018. 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 SSM project signed in 2012, stands out as Turkey's first Riot Control Vehicle with high-level ballistic protection. NMS was awarded a contract worth US$6.125 Million in late 2012 by the SSM to deliver 25 EJDER TOMA Riot Control Vehicles featuring the main automotive components of the EJDER 4x4 WAV and provide high ballistic protection to the crew against even 7,62mm infantry rifle shots. NMS displayed the prototype EJDER TOMA during the IDEF '13 Fair and started deliveries to the SGD during the second half of 2013. During Kobani protests in Hakkari province of Turkey on October 10th, 2014 one of EJDER TOMA vehicles that was sent to control riot was attacked by PKK militants with infantry rifles and RPG-7 rockets. Militants fired

Katmerciler's Anti-Riot Vehicle

two RPG-7 rockets and around 100 rounds of infantry rifle bullets against the EJDER TOMA, one of the rockets missed the vehicle but the other hit the windshield but did not explode. None of the crew was hurt during this attack thanks to EJDER TOMA's high level of ballistic protection. NMS delivered around 150 EJDER TOMA vehicles to the SGD, and the Turkish Army.

New Generation Armored Internal Security Vehicle of the Security General Directorate

To meet the requirements of the SGD for the new generation armored vehicle requirement through the use of local capabilities the SSM launched New Generation Armored Vehicle Program. As part of this program in order to evaluate and test candidate vehicles in advance, in 2013 the SSM awarded contracts to Otokar and NMS to deliver 11 URAL and 11 EJDER YALÇIN Block I 4x4 wheeled armored vehicles (WAV) to the SGD. Some of the URAL and EJDER WAVs were integrated with Aselsan SARP RCWS. Otokar completed deliveries in late 2013; NMS delivered EJDER YALÇIN vehicles in 2014. On November 25, 2014 Otokar announced that they were awarded a contract worth TL76,8 Million to deliver an undisclosed number of both URAL 4x4 Light Armored Tactical Vehicles and Armored Patrol Vehicles (APV) to the SGD. Under the contract deliveries were completed in 2015. According to sources under the contract Otokar delivered 126 URALs. For SGD, SSM also procured 60+90 Sentry (based on Toyota Land Cruiser 70 series chassis) and Jaws 4x4 Light Armored Tactical Vehicles from International Armored Group (IAG) Turkey. Deliveries took place during 2014-2016.

Otokar in May 2016 received a contract worth €64.8 Million for the delivery of an undisclosed number of APC, URAL and COBRA-I 4x4 armored vehicles to the SGD/ Turkish National Police. In June 2016 the company secured a new contract valued at €106.1 Million for the delivery of 220 COBRA-II WAVs to the SGD. Some of the vehicles to be armed with Aselsan SARP RCWS. Deliveries were completed in 2017. With this order SGD became the fourth customer of the COBRA II (after TurAF, Turkish Army and Gendarmerie General Command) in Turkey.

The first user of COBRA-II 4x4 WAV was the Turkish Air Force (they placed an order for 20 vehicles in 2015 and deliveries started in early 2016), followed by the Turkish Army. Under the contract worth €47.5 Million awarded in December 2015, MoND/SSM ordered 82 COBRA-II 4x4 Tactical Wheeled Armored Surveillance Vehicles (equipped with Aselsan's ŞahinGözü/FalconEye EO sensor and ACAR surveillance radar systems and Metravib's PILAR Gun Shot Detection System) for the Turkish Army. Deliveries to the 2nd and 3rd Armies' Border Units (responsible for the Eastern borders of Turkey) started in 2016 and were completed during the first half of 2017. Project has been financed via the EU funds.

Under a contract that became effective in April 2014, SSM ordered 180 EJDER YALÇIN Block III WAVs to NMS to meet SGD/Turkish National Police's requirement. Deliveries completed during the first half of 2017 and all of the vehicles are integrated with Aselsan SARP RCWS armed with 7.62mm machine gun. For the delivery of SARP RCWSs NMS signed a contract valued at €29.1 Million with Aselsan in April 2016. NMS previously received contracts for the delivery of 71 EJDER YALÇIN Block I (including 11 vehicles procured for the evaluation) and Block II to the SGD.

Both Otokar and NMS have granted one COBRA-I and one EJDER YALÇIN 4x4 Tactical Wheeled Armored Vehicle to GGC in 2016 and they underwent extensive operational tests. As a result of this experience GGC placed an order for an undisclosed number of COBRA-II and EJDER YALÇIN WAVs in 2017. The first batch of 30 EJDER YALÇIN Block III was delivered to GGC in May 2017.

On May 17, 2018, speaking at the TOBB Turkish Defense Industry Assembly Meeting Undersecretary Prof. Demir announced that over

300 COBRA-II and over 300 EJDER YALÇIN WAVs have been delivered to Turkish end users.

Developed over the existing COBRA-I vehicle, COBRA-II is a modular platform with superior technical and tactical characteristics. Besides outstanding mobility capability and up to nine crew (including driver and commander) carrying capacity, the vehicle provides protection, firepower and mission equipment for users in different types of missions. Produced against current threats to meet user expectations and was added to the Otokar product range in 2013, the COBRA-II Tactical Wheeled Armored Vehicle provides an outmatched performance in a wide range of challenging terrains and climatic conditions. In addition to superior technical and tactical features, COBRA-II also offers high degree of protection and forms a base for a modular platform. Unveiled first time in May 2013 COBRA-II has an overall length of 5,6m, a width of 2,5m and height of 2,2m. The wheelbase and ground clearance of the vehicle are 3,57m and 400mm respectively, while the gross vehicle weight is 12,000kg. The COBRA-II can negotiate a 48° approach and 60° departure angles leading onto 60% inclines and 30% side-slopes. It is able to cross 90cm wide trenches and climb over 40cm obstacles. The COBRA-II can be fitted with either 6,7 liters, 6 cylinders 281hp water-cooled turbo diesel engine or 6.7 liters, 6 cylinders 360hp water-cooled turbo diesel engine (Turkish users' preference) with F-34 and F-54 fuel compatibility. The COBRA-II has a top speed of 110km/h and a cruising range of 700km.

EJDER YALÇIN, a new member of the EJDER Family of wheeled armored vehicles, is a 4x4 tactical armored combat vehicle designed and manufactured by NMS. Design studies on the vehicle were initiated in the last quarter of 2012 and a pre-prototype of the base vehicle was exhibited at the IDEF '13 Fair. Mass production of the vehicle began in May 2014. Featuring a V-shaped hull design, integrating floating floor plates and blast mitigation seats to provide protection against mines and improvised explosive devices (IED) the vehicle accommodates up to 11 personnel. The vehicle features easy-to-enter and exit door configurations for the crew. Other optional equipment includes a rescue winch, day and night-vision systems, rear ramp, and a fire extinguish and explosion suppression system for the crew compartment. The base vehicle has a length of 5,42m, width of 2,48m and height of 2,3m. Its gross weight ranges between 12,000kg and 14,000kg, and payload carrying capacity is up to 4t. The Block I and Block II versions of EJDER YALÇIN are fitted with a Cummins engine, which produces a maximum power of 300hp at 2,100rpm. The engine is coupled to fully automatic transmission with hydrodynamic torque converter. But in Block III engine power is uprated and increased to 375hp. The EJDER YALÇIN has a maximum speed of 110km/h and a cruising range of 600km. It can accelerate from 0km/h to 40km/h within six seconds.

NMS on the other hand won its first export contract from Tunisia for its EJDER YALÇIN 4x4 WAV in early 2017. It is followed by orders from Uzbekistan, Qatar and Senegal. According to sources NMS will deliver 70+ EJDER YALÇIN to Tunisia, a large number of vehicles to Uzbekistan with local production, 342 vehicles to Qatar and 25 vehicles to Senegal. During

COBRA - II WAV

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DIMDEX 2018, which was held at the Qatar National Convention Center in Qatar's capital Doha on March 12-14, 2018 NMS also secured a contract to deliver 214 NMS 4x4 Wheeled Light Armored Vehicles to the 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 and scheduled to be completed in two years.

In October 2017, Aselsan secured a contract worth €29.676 Million from Undersecretariat for Treasury to deliver 57 Tactical Wheeled Armored Surveillance Vehicles for the protection and surveillance of Western borders (Bulgaria and Greece). Project is financed via the EU funds. Under the project Aselsan selected Katmerciler's HIZIR 4x4 WAV as a platform to integrate its ŞahinGözü (FalconEye) EO sensor, ACAR surveillance radar and Gun Shot Detection System. A contract valued at Euro10.485 Million was signed between Aselsan and Katmerciler for the procurement of 57 HIZIR 4x4 WAVs. After having been integrated with Aselsan's border surveillance system the vehicle was dubbed as the 'ATEŞ (Fire) Mobile Border Security System'. According to the MoND 2017 Activity Report ATEŞ Mobile Border Security System deliveries will start in December 2018.

HIZIR 4x4 Tactical Wheeled Armored Vehicle is designed and optimized for high performance under extreme operational conditions in rural and urban areas for 9 personnel. The vehicle has high level of ballistic and mine protection. It is agile, dynamic, versatile, low maintenance and easy-care platform for various configurations such as combat vehicle, command control vehicle, CBRN vehicle, weapon carrier (easy integration of various weapon systems), ambulance vehicle, border security vehicle, reconnaissance vehicle. Katmerciler unveiled for the first time the 'HIZIR' its new armored combat vehicle on the '3rd High-Tech Port by MÜSİAD' organized in Istanbul on November 9-12, 2016. With 400hp (298kW), the HIZIR is the combat vehicle, which has the highest engine power in its range in the Turkish Defense Industry. The vehicle has a gross weight of 16,000 kg and can reach a top speed of 110km/h. HIZIR 4×4 features a V-shaped monocoque armored hull design that offers advanced protection to the 9-man crew. HIZIR can be configured for a wide range of missions including command and control, medical evacuation platform, forward observation and convoy support. The HIZIR is fitted with an Aselsan SARP Stabilized Advanced Remote Weapon Platform. Depending on the requirements, the SARP can be equipped with a 12.7mm machine gun, 40mm automatic grenade-launcher or 7.62mm machine gun.

HIZIR 4X4 WAV

On the other hand, under the New Generation Crime Scene Investigation Vehicles (KIRAÇ) Project, Katmerciler secured a contract from the SSM in June 2017. The contract calls for the design, development and delivery of 110 Crime Scene Investigation Vehicles and 10 Laboratory Vehicles in a two-year schedule. The vehicles will be in 4x4 configuration and will feature independent suspension system.

NMS 4X4 Wheeled Light Armored Vehicle

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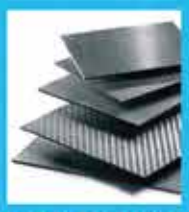
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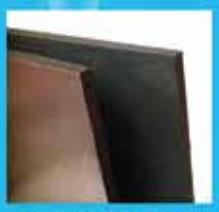
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EFES-2018 Combined Joint Live Fire Exercise "Distinguished Observer Day" Successfully Accomplished

The EFES-2018 Combined Joint Live Fire Exercise, one of the planned exercises of the Turkish Armed Forces which is held every two years, was conducted between April 11 and May 11, 2018 with the participation military units of friendly and allied countries. The active phase of the exercise took place between 07-11 May 2018 with the participation of 24 allied country military units in the Western Anatolia, Middle Aegean, İzmir Gulf and Doğanbey drill fields.

The EFES-2018 Combined Joint Live Fire Exercise Distinguished Observer Day activities were held between 09-10 May 2018 with the participation of Chief of General Staff Major General Hulusi Akar, Land Forces Commander General Yaşar Güler, Air Forces Commander General Hasan Küçükakyüz, Naval Forces Commander Vice Admiral Adnan Özbal, as well as the Minister of Defense of Azerbaijan, the Chiefs of General Staff of Bosnia and Herzegovina, Georgia, Qatar, Kazakhstan, Kuwait, Nigeria, Uzbekistan, Romania, Sudan, the Saudi Arabia Royal Court Member and the Commander of Islamic Coalition Against Terrorism (former Land Forces Commander of Pakistan).

A press briefing was held at the additional building of the Konak Officer's Club before the night session of the Efes-2018 Combined Joint Live Fire Exercise Distinguished Observer Day, which started in the Doğanbey-Seferihisar district of Izmir. In the briefing given by Lieutenant Colonel Taner Balkan it was announced that a total of 7,500 troops from 24 countries to be involved in the exercise with Turkey. Lieutenant Taner Balkan stated that the exercise was transformed into a combined exercise with the participation of various countries in 2016 and continued, "This exercise will be the second combined joint exercise, different than the previous years, this year our number of participants increased to 23 countries from 8 countries. The experience gained through Operation Euphrates Shield and Operation Olive Branch as part of the fight against terrorism were reflected in the exercise. Moreover, the hybrid troop training and executive staff training were included in the exercise". In the exercise, for

the first time the second vessel manufactured within the scope of the Anti-submarine Warfare and Patrol Ship MILGEM 'Büyükada' and LST 'Bayraktar', CH-47 Chinook Transport Helicopters, Tactical and MALE class UAVs, 'Korkut' self - propelled low altitude air defense system and the MPT-76 Modern Infantry Rifle taking part in the Turkish Armed Forces Inventory were utilized. 14 governmental institutions and associations attended the exercise where 38 countries were invited as observers. Furthermore, 35 defense industry companies took part in the defense industry exhibition hall with their unique products and capabilities. Turkish General Staff, Land Forces Command, Naval Forces Command, Air Forces Command, Special Forces Command, Coast Guard Command, civil governmental institutions and associations, troops and military units from the USA, Azerbaijan, Bahrain, Bangladesh, Bosnia - Herzegovina, Algeria, Georgia, United Kingdom, Italy, Qatar, Kazakhstan, Kosovo, Kuwait, Hungary, Macedonia, Malaysia, Mongolia, Uzbekistan, Pakistan, Romania, Slovakia, Jordan and Saudi Arabia also attended the exercise".

In his remarks on the Distinguished Observer Day, Chief of General Staff Major General Hulusi Akar expressed that the Turkish Armed Forces, with the principle "The greatest appreciation is confidence, the greatest success is deserving that confidence", once again successfully executed the EFES-2018 drill and with its superior preparedness for warfare it once again proved to the world that it was constantly in the service of its nation.

Underlining that with the qualified and versatile staff and the international peace support operations, Afghanistan being in the first place, the Turkish Armed Forces would always be appreciated by the Turkish nation and the world; General Akar stated that in the rapidly changing complex environment, within the


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scope of the 'comprehensive approach' based on the utilization of the national force units in a way that they support each other, the success of the exercise depends on the action of all military and civilian institutions and associations in cooperation.

Touching upon the fight against terrorism, Operations Euphrates Shield and Olive Branch as well, General Akar noted that exerting utmost efforts for regional peace and stability Turkey always supported Syria's territorial integrity and political unity within the scope of good neighbor relations, yet as the execution of a cross - border operation became inevitable for securing the security and stability in the country, Turkey taking part at the forefront at the global struggle against the ISIS, conducted Operation Euphrates Shield in 2016 and neutralized approximately 3,000 ISIS terrorists and therefore inflicted a heavy blow to ISIS. Stating that in order to maintain security and stability in the region, they launched Operation Olive Branch on 20 January 2018, General Akar added that the effective utilization of the domestic and national weapon systems, especially the unmanned air systems played a big part in the execution of the operation with outstanding success, without causing any harm to the civilians.

Stating that upon the completion of the operation and clearance of the region from mines and handmade explosives, the people of Afrin started to return their homes in trust and peace, General Akar added that with the contribution of the Turkish


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Armed Forces in the region, the activities for rapidly covering the basic requirements - healthcare services being in the first place- of the people of the region, and the humanitarian aid activities in addition to the transport of other aid material were continuously executed.

General Akar also touched upon the protection of our rights and interests in the Eastern Mediterranean and Aegean Sea and added that Turkey was on the side of resolving the existing issues in the Aegean within the framework of international law and good neighbor relations, that all types of efforts were exerted with good will for rendering the Aegean Sea a sea of peace, friendship and cooperation and at the same time underlined that the Turkish Armed Forces, with the will and determination of protecting our country's rights and interests based on the international law and treaties, would not allow a fait accompli in our seas. Stating that the Turkish Armed Forces will continue to protect the rights and interests of Turkey and the Turkish Republic of Northern Cyprus in the Eastern Mediterranean and be the warrant of peace and security at the Island of Cyprus in line with the international guarantee and alliance agreements, General Akar emphasized that to this end, the Turkish Armed Forces adopted all types of measures with determination both in the Aegean Sea and in the Eastern Mediterranean Sea.

General Akar thanked the exclusive staff of the participant countries, governmental institutions and associations, the representatives of the civil institutions and members of the Turkish Armed Forces who planned the EFES - 2018 Exercise and contributed to the successful execution of the exercise in full coordination and concluded his speech.

The Night Exercise session of the EFES 2018 - Combined and Joint Live Fire Distinguished Observer Exercise was held on May 9, 2018 and prior to the night exercise, Chief of General Staff General Hulusi Akar and the visiting Chiefs of Staff visited the Defense Industry Exhibition stand area and acquired detailed information from the representatives of the companies on their products and capabilities.

Following this visit, the night activities of the Efes 2018 - Combined and Joint Live Fire Exercise Distinguished Observer Day started.

In line with the generic scenario of Efes 2018 Combined and Joint Live Fire Exercise, the battle between the neighbor countries Arnland and Torrike was actualized in the exercise. According to the generic scenario, upon Torrike's occupation of the island, Arnland called for the United Nation's help. Upon the call of the United Nations, allied troops were formed under the leadership of Turkey and with the participation of the USA, Azerbaijan, Bahrain, Bangladesh, Bosnia - Herzegovina, Algeria,

Georgia, United Kingdom, Italy, Qatar, Kazakhstan, Kosovo, Kuwait, Hungry, Macedonia, Malaysia, Mongolia, Uzbekistan, Pakistan, Romania, Slovakia, Jordan and Saudi Arabia. The allied troops rescued the island occupied by the symbolic country Torrike.

The night activity session was conducted between the hours 19.56 and 21.32. The Special Forces, SAS and SAT troops amphibious assault landing executed from the sea and air and neutralized the planned targets. The planned targets utilized the actual ammunition and were subject to artillery firing by the land troops while the Turkish and allied countries' F-16 fighter jets hit the identified targets. In addition to howitzer firing, the helicopters hit the targets identified for them. Meanwhile, the SAT and SAS commandos detected the mines at sea and demined the area. As the Attack helicopters destroyed the targets identified by the Special Forces in the field, the preliminary reconnaissance was executed for the assault of the amphibious troops. In coordination with this exercise, the attack helicopters fired the identified zones as well. Additionally, the enemy forces detected at the launching areas were fired by the armed unmanned air vehicles (AUAV) utilized for the first time in this exercise. The red points representing the tanks of the opposing forces were fired through missiles while 4 T129 'Atak' helicopters destroyed the targets identified side by side as well. Upon the finalization of the first air raid operation, the landing shifts completing the required landing preparations and containing the tank and armored personnel carriers approached the coast. The first wave of amphibious naval infantry forces was disembarked. During the landing, an air raid of the opposing forces towards the troops of the allied countries was responded to with counterfire with the air defense systems.

The night session ended upon the completion of the aforesaid activities.

Pakistan and Turkey Sign a Contract for the Procurement of T129 "Atak" Helicopters

Pakistan to procure 30 T129 "Atak" Helicopters from Turkey

The contract regarding the sale of T129 "Atak" Helicopters was signed recently between Turkey and Pakistan. For nearly two years the two countries have been working on ways of funding Pakistan's procurement of the T129 "Atak" Helicopters.

The award of the contract for the sale of 30 T129 "Atak" Helicopters to Pakistan was officially declared by within the scope of the Justice and Development Party's election declaration of 2018 prior to the Presidency and General Elections that will be held on 24 June 2018.

TAI held an effortful test campaign in Pakistan that lasted for 15 days in 2016. Throughout the test campaign, Pakistani pilots pushed the limits of the T129 "Atak" helicopter under harsh conditions, both night and day in the Pana Aquil – Chor and Quetta regions which are considered to be the hottest and highest region of Pakistan. With the superior performance it demonstrated with the maximum take – off weight (5000 kg) and with temperatures at 23 degrees Celsius at an altitude of 14,000 ft. the T129 "Atak" Helicopter received full marks from the Pakistani pilots and authorities.

Şahid Hakan Abbasi, the Prime Minister of Pakistan visited Turkey in October 2017 for the 9th Summit of the D-8 Economic Cooperation Organization and scrutinized the T129 "Atak" Attack and Tactical Reconnaissance Helicopter and attended a test flight. Following the test flight, the Prime Minister commented on the helicopter and the flight, "As a pilot, I must say that in my opinion, this helicopter is the best and most effective attack helicopter in the world. The Pakistani Armed Forces have been testing this helicopter in depth and appreciate it in terms of its technical features and selected it. Currently our contract negotiations are in full speed and everything is running on track. We plan to procure this helicopter as soon as possible and include it to the inventory of the Pakistani Armed Forces".


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On March 23, 2018, three T129 "Atak" Helicopters in the inventory of the Turkish Land Forces Command conducted a demonstration flight as part of the events carried out for the Independence Day of Pakistan and enhanced the expectations for the award of the contract.

With this contract signed between Pakistan and Turkey, the T129 "Atak" Helicopter, developed and manufactured by TAI, will be exported to a foreign country for the first time. The official signing of the contract is expected to take place soon at a ceremony to be held with the participation of the Presidents of both countries.

35 "Atak" Helicopters in Total Delivered to Turkish Land Forces as of the End of May

Within the scope of the program where the procurement of a total of 50 helicopters in Phase-1 and Phase-2 configurations (29 helicopters in Phase-1 configuration and 21 helicopters in Phase-2 configuration) is planned, the contract was signed between TAI and the Undersecretariat for Defense Industries in 2007 for fulfilling the requirements of the Land Forces Command, a total of 35 T129 "Atak" Helicopters consisted of 9 Early Delivery Helicopters (the delivery was completed in December 2015) and 26 helicopters in Phase-1 configuration were delivered to the Land Forces Command as of the end of May. Following the completion of the delivery of the Phase-1 package, the delivery of the Phase-2 configuration which is composed of 21 helicopters is planned to be launched as of July 2018.

The first 3 helicopters as part of the program containing the delivery of 18 T129 "Atak" Helicopters for the needs of the Gendarmerie General Command were delivered on April 19 at a ceremony held with the participation of the Minister of Internal Affairs Süleyman Soylu and the Undersecretary for Defense Industries Prof. İsmail Demir.

Apart from the Land Forces Command and Gendarmerie General Command, the National Police will be procuring 9 T129 "Atak" Helicopters in the upcoming period.


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TurAF F-35A Makes its Maiden Flight

The first F-35A Lightning II which will be delivered to the Turkish Air Force (TurAF) performed its maiden flight on May 10, 2018, at the Lockheed Martin's Fort Worth facility in Texas. Piloted by US Navy Test Pilot Cmdr. Tony Wilson, the F-35A AT-01 (serial 18-0001) took off at 14:47 local time and landed at 16:00 local time. During a 1 hour 15-minute flight test, a chase of an F-16 escorted the TurAF's first F-35A flight

Despite speculation and opposition from certain circles in the US, the F-35A AT-01 (serial 18-0001) is expected to be handed over to the TurAF on June 21, 2018 with the official delivery ceremony to be held in the US. Three U.S. Senators have urged the U.S. administration to suspend the delivery of F-35A Lightning II jets to Turkey because of the latter's decision to buy S-400 TRIUMF Air and Missile Defense System from the Russian Federation. On April 26, 2018 Senators James Lankford, Jeanne Shaheen and Thom Tillis introduced a bi-partisan bill to block the transfer of F-35s to Turkey. The bill would also block Turkey's role as a maintenance depot for the F-35 aircraft. "Turkey's strategic decisions regrettably fall more and more out of line with, and at times in contrast to, U.S. interests. These factors make the transfer of sensitive F-35 technology and cutting-edge capabilities to Turkey increasingly risky," Senator Lankford had said. However, the Turkish Government remains firm that any move to block the F-35 purchase would result in retaliation. According to Foreign Minister Mevlüt Çavuşoğlu, Turkey will react if the US enacts a proposed law that would halt weapons sales to the country.

Meanwhile on May 17, 2018 U.S. Congressman David N. Cicilline introduced the bi-partisan 'Ban F-35 Joint Strike Fighter Sales to Turkey Act'. The 'Ban F-35 Joint Strike Fighter Sales to Turkey Act' prohibits the sale or transfer of F-35 aircraft and any related intellectual property or technical data to Turkey. On May 23, 2018 during a Congressional testimony U.S. Secretary of State Mike Pompeo said, "We continue to work to keep the Turks in a place where they don't actually acquire the S-400. I believe that they have not yet, and we are hopeful they will never take possession," When asked whether the State Department had made a decision about Turkey's purchase of F-35s, Pompeo answered, "I have not."

On May 24, 2018 the House of Representatives in the U.S. Congress passed its version of a US $716 billion defense policy bill including a measure to prevent Turkey from purchasing Lockheed Martin F-35 jets. The National Defense Authorization Act (NDAA) is several steps from becoming law. The Senate must still pass its version of the bill and the two versions must be reconciled before a final compromise bill can come up for a vote in both the House and Senate later this year.

Turkey as a 'Level 3' partner contributes US $195 Million to the Joint Strike Fighter (JSF) Program. 10 Turkish defense and aerospace companies have been supporting the development and production phases of the F-35 fighter jets as part of Turkey's partner role in the JSF Program. Turkish Industry has a significant Industrial Participation role in supporting Lockheed Martin and Pratt Whitney for F-35 aircraft sustainment and F135 turbofan engine production and sustainment. Turkey has been given the approval to build/assemble its own F135 engines and was also selected to have the first European Regional F135 Engine depot overhaul capability. Both the engine production and overhaul will take place at the 1st Air Maintenance Factory Directorate (1st AMFD, former 1st HIBM) in Eskisehir. Additionally, TAI has also been assigned to represent the organic depots of the Turkish Armed Forces (TAF) within the Autonomic Logistic Global Sustainment (ALGS) system and Havelsan has been assigned as the Turkish Integrator for the National Integrated Training Center (ITC). In May 2013, Prime Contractor Lockheed Martin declared that Turkey is projected to earn US $12 Billion from licensed production of F-35 components.

Turkey has a plan to procure up to 100 F-35A, conventional-take-off-and-landing (CTOL) variant, by 2031. F-35As. So far, Turkey has placed an order for a first batch of 14 (2+4+8) F-35As. First two F-35As in Block 3F configuration were ordered in 2014 under LRIP-10. Then Defense Industry Executive Committee

(DIEC), the highest decision-making body in defense procurement in Turkey, approved the procurement of a further four under the LRIP-11 during the January 7, 2015 meeting and an additional eight F-35As (at the end of meeting the value of the purchase was announced as US $1.4 Billion by Undersecretary Prof. İsmail Demir) under LRIP-12 on March 9, 2016 meeting. Since LRIP-12 was taken under Series Production Phase by F-35 Joint Program Office (JPO) and partner countries were asked to deliver their orders under Block Buy approach Turkey has decided to add the previously decided upon eight F-35As into a Block Buy package to gain a price advantage. During the October 28, 2016 meeting the DIEC approved the Block Buy of 24 F-35As (8+ 16, eight of them were previously planned to be procured under LRIP-12) over three contract years. By the end of 2022 the TurAF is expected to receive a total of 30 F-35As and all will be deployed at the 7th Main Jet Base in Malatya, first main Operating Base of the TurAF F-35As. The 172nd and 171st Squadrons of the 7th Main Jet Base Command will receive the first two batches of F-35As. Contracts for the first batch of 14 F-35As already awarded and the F-35A AT-01 (serial 18-0001) is the first of these 14 F-35As. These 14 F-35As are expected to be deployed at F-35A Operational Conversion Unit (OCU) Squadron (probably 172nd Squadron) at the 7th Main Jet Base. Contract for the second batch of 16 F-35As is expected to be awarded soon. Second batch of 16 F-35As are expected to equip 171st Squadron.

According to current plans the F-35A AT-01 (serial 18-0001) will stay in the U.S. (at Luke Air Force Base, Arizona, where the TurAF pilots will perform training on the aircraft, maintainers will receive their training at Eglin Air Base) until September 2019. Two TurAF pilots are currently receiving Instructor Pilot training in the U.S. Their training program started in early 2018. An undisclosed number of TurAF pilots will receive F-35A flight training in the U.S. After the Instructor Pilot training is completed, and the second F-35A is delivered, the two F-35As will be flown by Turkish pilots to 7th Main Jet Base in September of 2019, with several air-to-air refueling serials. The 7th Main Jet Base will also host the National Integrated Training Center (ITC) for the TurAF F-35As.

Meanwhile, Turkish Navy is also planning to procure up to 32 F-35Bs to deploy at two LHDs (TCG Anadolu [under construction and is expected to enter service in 2021] and the second LHD [planned to be constructed during the second half of 2020s]). The Turkish Navy already selected two pilots to be trained on the F-35B in the U.S. According to sources soon after a DIEC decision is made regarding F-35B procurement for the Turkish Navy these pilots will receive Advanced Jet Training for T-38M aircraft at the Çiğli Air Base (2nd Main Jet Base Command) in Izmir, Turkey and then will fly to the U.S. to receive F-35B flight training.

The Chairman of the Aselsan Board & CEO - Prof. Haluk Görgün Meet up with Media Representatives in Ankara

Established in 1975 to fulfill the communication requirements of the Turkish Armed Forces through national and indigenous products, Aselsan has climbed to the 57th rank on the list of the World's greatest 100 defense industry companies. In the 43th year of its foundation, while strengthening its position in the international arena and exporting the products it has developed to more than 60 countries, Aselsan continues to build upon their success stories with its achievements in 2018

Aselsan's Chairman of the Board and CEO Prof. Haluk Görgün gathered with the representatives of daily newspapers and defense magazines in Ankara. He appointed as an Aselsan Board Member in 2017 when he was the President of Gebze Technical University and then assigned as the Chairman in the beginning of April 2018 and also as the CEO of the company on April 27th, 2018.

Informing the media representatives on Aselsan's 2017 financial performance, its planned investments and projections for the future, Prof. Görgün stated that where Aselsan's gross income was 923 million TL in 2016, it reached 1.355 million TL in 2017 and added that company's net profit increased to 1.388 million TL while they broke a record in the backlogs. Expressing that Aselsan's orders in 2017 reached the level of $6.8 billion, Prof. Görgün continued: "Maintaining its activities for a 'Stronger Turkey', Aselsan became the most essential address of national, domestic, indigenous and reliable technology with the activities and investments it launched. Maintaining its activities with the mission of minimizing the foreign dependency of the Turkish Armed Forces and our devoted security forces, with its products Aselsan became a brand preferred not only in the domestic market but also in the international arena. In 2017, Aselsan made sales in the level of 5.4 billion TL and increased its backlogs to $6.8 billion ($2.143 billion of them were from new orders). The company's turnover of 2017 reached 5.360 million TL and Aselsan realized 52 percent of its sales to Turkish Armed Forces (TAF), 33 percent to private institutions / other institutional customers and 15 percent of its sales have been exports. Achieving a critical business potential enabling growth for 2018 through the orders it received, Aselsan has made its mark in crucial investments in the area of R&D. The R&D expenses of the company were 1.243 million TL in 2016 and it reached 1.675 million TL in 2017. Conducting 33 percent of the defense industry's R&D in Turkey, Aselsan is in the position to accomplish the highest expenditures for R&D in Turkey".

Aselsan Aims to Utilize its Affiliates in Foreign Countries More Effectively in 2018

In the meeting, Prof. Görgün relayed critical information on Aselsan's international investments and export figures and added, "With its wide variety of products, conducting exports to more than 60 countries in 5 continents since its establishment, its direct investments with production infrastructures in 6 countries, its active participation in joint research/ development/ production programs with the NATO and its reinforced high production quality, our company is active in a wider geography and more diverse areas of activity. In line with its growth strategy in the recent years based on indigenous products, Aselsan left the image of an internally growing company and transformed into a company that establishes affiliates at home and abroad or one that becomes partners with major companies. Aselsan established factories where it manufactures its indigenous products and thus sells them to neighboring countries. Aselsan owns 100 percent of the shares of the factory in Azerbaijan, 49 or 50 percent of the shares of such factories in the UAE, Jordan, Kazakhstan and Saudi Arabia. Aselsan owns branch offices in South Africa and Macedonia and has a company titled Aselsan Malaysian in Malaysia. Moreover, Aselsan owns 85 percent of the shares of a company executing microelectronic design in Istanbul. We are determined to develop our relations further with the countries of Middle East being in the first place, Latin America, Sub-Saharan

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Africa, Caspian Region, Asia and Pacific and carry the Aselsan brand and products to the front row in worldwide selections."

Stating that they do not prefer setting restrictive targets in exports, Prof. Görgün said, "Last year we obtained 15 percent of our turnover from exports and achieved $215 million in exports. There is a significant increase compared to the year before. We attach great importance to export revenues. We will be following this process closely with our Board and Steering Committee delegations. Our Board Members will be more active from now on. We made a distribution of tasks here and we will be firmly following the exports. Upon the public offering of Aselsan's shares in June, we will be visiting our affiliates in foreign countries. We will be examining the ways of developing the existing potential in these countries further and ways of growing our existence. We will increase our technical support to the countries in which we have assets or which we conduct export activities and we will adopt an approach that provides more support from the center. You will witness the crucial increase of our export in 2018 yet at this point I would like to state that we do not wish to set restrictive targets for our company. We plan to reach all points available."

Aselsan Allocating Most to R&D From its Own Resources

Noting that Aselsan's most critical power is the company's qualified staff, Prof. Haluk Görgün added, "Of our company with 6 thousand staff, over 58 percent is composed of engineers. 35 percent of our employees have either postgraduate or PhD degrees. Over 3.000 R&D engineers are working at our 6 R&D centers. We conducted 117 R&D projects with 30 universities in 2017. Moreover, the Aselsan Academy Postgraduate Training Program, launched for generating a solution with an innovative approach to the development of technology and know-how through the thesis studies in areas in which an industrial institution is active, is

Prof. Haluk Görgün - The Chairman of the Board & CEO of Aselsan

fulfilling a critical function. With the launch of the Aselsan Academy our premises have turned into a campus."

Prof. Görgün said that Aselsan, allocating 7 percent of its turnover to R&D each year, remaining at the top of the list at R&D expenses, became a technology company that is capable of conducting design and production of the materials having details in nanometer dimensions, able to design and manufacture devices and systems for all types of land, air, naval and space vehicles and capable of integrating these devices and systems to all types of platforms as a result of the technology development activities it conducted and continued: "Aselsan has also been exerting efforts for the utilization of the technologies it created in addition to the defense industry area. Aselsan continues its activities in transportation, energy, security and healthcare electronics as well. In this way, our company wishes to minimize Turkey's technological foreign dependency also except for the defense industry area and contribute to the efforts to reduce the current deficit issue of the country through enabling the production of cutting edge technology products with high added value."

Stating that they adopted a decision for using a quite wide area at Gölbaşı as a single center Prof. Görgün added, "Our production lines will be completely transferred to that location in time. I think we may start within three years. Gölbaşı will be our sole center".

Prof. Görgün: "We plan a Road Show abroad prior to the public offering"

Replying to questions from the media during the Q&A session, Prof. Görgün underlined that they will be executing the second public offering in June 2018 and continued: "Within June we will have completed the second public offering process. Within this scope, we plan to conduct a Road Show aiming to attract foreign investors to our country, and between May 25 and June 5 we will be conducting approximately 60 meetings within 10 days."

Upon the question regarding whether they plan to make changes on industrial departments and organizational changes Prof. Görgün stated that their primary approach is to increase exports and produce critical products through national resources adding that they do not think of such organizational changes for the time being.

Replying to a question regarding the Aselsan Academy Prof. Görgün said, "In Aselsan, presently our 1.000 employees are taking courses in different universities for their postgraduate and PhD degrees. We enable each staff 17 hours a week to attend these programs. We allow our 1.000 employees for these courses for a total of 17.000 hours per week. Most of these employees who received postgraduate and PhD training in various universities were employed in programs that did not really bring any advantages to our institution except for the projects they work on at Aselsan. Upon the consent and permission of our Board, we conducted various activities to this end with our Board Members and we established the Aselsan Academy in line with a formation that would be approved by the Council of Higher Education. We launched this degree program composed of four universities including the Gazi University and Middle East Technical University from Ankara, Gebze Technical University and Istanbul Technical University from Istanbul. With the help of this program our engineers selected one of these four universities for their postgraduate or PhD studies while meeting the

acceptance conditions of these universities and selected their courses from a joint course pool created by all these universities and started their postgraduate and PhD studies. Presently over 200 Aselsan employees are registered in these programs. Aselsan turned into a campus now and our loss of time has been reduced. We made a transition into a new era regarding the cooperation between university and industry. As a result, academicians have started to gain more experience in defense industry projects."

Regarding a question about whether there is brain-drain from Turkey in recently, Prof. Haluk Görgün stated that there is such a case now and added that measures should be adopted to prevent such brain-drains in the future. Prof. Görgün continued, "Transfer of the staff trained in the Defense Industry and that have worked on critical programs to foreign countries should be prevented. A national measure should be taken to this end. On the other hand, certain activities toward attracting valuable staff employed abroad to our country and our institution are being executed. Our human resources department has been executing critical activities regarding reverse brain drain. We have incorporated over 100 valuable staff into our institution with the help of such activities during this period."

Following the meeting, a brief information tour was realized at the Macunköy facilities of Aselsan for the members of the press accompanied by Aselsan's Deputy Chairman Mustafa Kaval.

SARP RCWS – Being Utilized by 16 countries

During the tour, Aselsan's Deputy Chairman Mustafa Kaval initially shared up to date information on the SARP Remote Control Stabilized Weapon System (RCWS) with media representatives. Sharing that the indigenous SARP RCWS system developed by Aselsan became a standard remote control stabilized weapon system in Otokar's "Cobra", Nurol Makina's "Ejder Yalçın" and BMC's "Kirpi" armored vehicles. Kaval continued: "We are capable of manufacturing 7 SARP RCWS per day and approximately 150 SARP systems are being produced in a month. As of today, we manufactured 1.453 SARP RCWS. During these production periods we are closely monitoring our sub-contractors. We diversified our sub-contractors and we are having the same products manufactured by different suppliers in order to enable the substitution in cases of failures. I would like to state that we have been exerting utmost efforts in order to meet the demands. SARP RCWS could be utilized with one of the 7,62mm machine gun, 12,7mm machine gun and 40mm grenade launcher weapon alternatives. There is a dual weapon in the SARP dual configuration that carries 7,62mm machine gun and one of the other weapon systems I mentioned

previously. The firing tests of the new version developed in line with the demands from abroad still continue. Here, the SARP RCWS system is capable of carrying two anti-tank missiles additionally. On the other hand, we successfully integrated the weapon systems of both NATO and Russia origin to the SARP RCWS. With its competitive price, currently 16 countries are using these systems."

Underlining that Aselsan's 120mm automatic loaded Mortar, automatic air system was presently being installed to BMC's armored vehicle, Kaval noted that this vehicle will be a system that will be utilized effectively especially in the struggle against terrorism and the asymmetrical battle environment.

AHS-120 Aselsan 120 mm Mortar System

AHS-120 Aselsan 120 mm Mortar System, originally designed entirely by Aselsan including sub-systems, is a modern weapon system integrated on a 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 that 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 target most effectively with minimum amount of ammunition and quick deployment.

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

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

Mustafa Kaval: "Aselsan concentrated on Smart Ammunition"

Underlining that Aselsan has been conducting indigenous activities on ATOM 35mm airburst ammunition as well Kaval added that installing automatically the explosion time to the 35mm airburst ammunition beforehand is possible and continued: "We are able to identify in how many seconds the smart ammunition will explode without liasing with the ammunition, with the help of the data provided by the fire control system as the smart ammunition is fired. This ammunition is airburst right before the target and as the particles are spilled out the target is nullified. This system could be utilized for destroying the missile systems and rocket systems launched from aircrafts and unmanned air vehicles. We have almost accomplished the development activities for the 40mm grenade launcher version of this smart ammunition as well. The qualification tests are about to be completed and we finished our own tests."

Stating that they are conducting activities on the New Generation Fırtına-2 Self-Propelled Howitzer System as well, Kaval told that they developed a national system through the Fırtına-2 program that is more precise and reacts more rapidly, Kaval said, "We acquired additional capabilities to the Fırtına Howitzers by adding automatic munitions loading, climatization of the internal ammunition and conditioning systems. Besides, we integrated the SARP RCWS over the new generation Fırtına-2 Howitzers."

Kaval stated that they gained certain additional capabilities to the M60T Main Battle Tanks which were modernized previously within the scope of the modernization of M60T tanks and continued: "We gained these tanks the 360-degree surveillance system, missile warning system, SARP RCWS, smoke grenade launchers and enhanced armor capability. We still carry out the integration activities of the AKKOR Pulat Active Protection

ATOM 35mm airburst ammunition firing test

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System (APS). We realized the firing tests of this system and by the end of this summer we will have integrated the AKKOR Pulat APS systems to these tanks. AKKOR Pulat APS does not have a mobile launcher structure, it is fixed, and it is located at six different points of the tank and every launcher has a coverage zone and visual angle. The ATGM or RPGs to be launched to the tank thanks to the sensor named as trigger radar is identified by these launchers and counterfire is made automatically within milliseconds and anti-tank ammunition is destroyed."

AKKOR Pulat APS will be Integrated to M60T Fırat Tanks

Within the scope of the AKKOR Pulat APS project that was initiated on 28 June 2017 by the Undersecretariat for Defense Industries for fulfilling the urgent requirements, emerging in the aftermath of Operation Euphrates Shield the tanks within the inventory of the Turkish Armed Forces were hit with the anti-tank guided missiles and rocket threats. To prevent casualties M60T Fırat tanks were utilized with their active protection systems, capabilities realized through the know-how accumulated in the AKKOR APS with was developed indigenously by Aselsan.

According to the scheme published in March via the official twitter account of the Undersecretariat for Defense Industries, firing tests with trigger radars were realized in February 2018 and successful results were achieved during these tests. The system successfully passed the firing tests conducted against various anti-tank guided missiles in March as well. Upon the completion of these tests, the first delivery is aimed to be conducted at the end of 2018 summer after the completion of the qualification and the system is aimed to be integrated to the modernized M60T Fırat tanks.

AKKOR Pulat APS is composed of 3 components namely the control board, power distribution unit and counter measure module. High technology trigger radar and counter measure ammunition are installed over the counter measure module. AKKOR Pulat APS has a rather constant structure compared with the AKKOR system developed uniquely by Aselsan and it provides 360 degrees of protection to the tank thanks to 6 launchers placed over the tank in 60-degree angles. With the help of the trigger radar and sensor over the launchers, AKKOR Pulat APS is capable of sensing multiple threats and destroying them with hard-kill method. In addition to the anti-tank guided missiles, the system provides high protection against the missiles fired at a close range.

Underlining that the AKKOR APS that is being developed indigenously by Aselsan will also be utilized at the "Altay" Main Battle Tank, Kaval stated that AKKOR APS is a mobile system different that the AKKOR Pulat APS and continued: "It has detection radars capable of identifying threats within 360 degrees. These detection radars direct the launchers over the tank towards the direction of the threat and enable the destruction of the missile within milliseconds. Upon the completion of the qualification activities, we aim to utilize the AKKOR APS in "Altay" MBT in 2020."

Aselsan AKKOR Active Protection System will be Utilized in Altay MBTs in 2020

Aselsan initiated development of the AKKOR APS with its own resources in 2008. The tests, where radar, central computer and hard-kill ammunition of the system were tested and successfully completed in 2010.

The preliminary design process (PDR) of the AKKOR system which is decided to be officially utilized at the "Altay" MBT with a contract signed between SSM and Aselsan on 30 November 2015 for using the unique and national active protection system in the "Altay" MBT was completed on 19-20 January 2017. In the program where the critical design meeting was executed on 25 December 2017, the prototype production and field tests were planned to be made in 2018 and in the verification firing tests and extended mobile firing tests will be conducted in 2019. Following the completion of the test and qualification processes, AKKOR APS is aimed to be rendered available for mass production and integrated to the "Altay" Main Battle Tanks.

AKKOR system, that will increase the survivability of the "Altay" MBT against the anti-tank missiles and rockets, will have both hard-kill and soft-kill capabilities. With the help of the very high resolution hard-kill radar located at four points of the tank that provides a full 360 degrees of full horizontal protection and tank laser warning system. The tank is capable of rapid reaction to the threats and the smart protection ammunition fired through the mobile hard-kill ammunition launchers that are placed at both sides of the tank allow for the capability to engage different targets and capacity to destroy the target by exploding at an optimum distance due to the smart fuse.

Mr. Mustafa Kaval gave a information about the APS system in front of the AKKOR Pulat APS mounted over the M60T FIRAT Tank

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2017 Turkish Defense Industry Export Figures Indicate a Decline in Export Sales

Turkey Union of Chambers and Commodity Exchanges (TOBB), Defense Industry Sector Council Meeting took place with the chairmanship of Council Chair Yılmaz Küçükseyhan presiding at the Union Center Social Facilities Conference Hall on May 17, 2018. The Undersecretary for Defense Industries Prof. Ismail Demir and senior representatives of the Turkish defense and aerospace companies attended the meeting.

Upon Council Chair Küçükseyhan's opening remark and his delivery of information on the 3-month period of the Defense Industry Executive Committee, General Secretary of the Defense and Aerospace Industry Manufacturers' Association (SaSaD) Hüseyin Baysak presented the Industry's Performance Report for 2017 to the participants and assessed the collected data. TOBB Defense Industry Council Chair Yılmaz Küçükseyhan conveyed information on the activities they performed within the 3-month period after their meeting last December.

Noting that the cross-border military operation conducted increased the prestige of our defense industry and Turkey abroad, Küçükseyhan told the members of the industry: "In addition to the success of our hero soldiers during these operations, the contribution of our defense industry could not be denied. We successfully surpassed a test with our armored battle vehicles, attack helicopters, unmanned air vehicles, artillery systems, unique missiles, rockets and smart ammunition. Our industrialists worked in three shifts and gave great support to our Armed Forces". Underlining the requirement of immediate collection of feedback from industrialists after these operations Küçükseyhan added, "Our industrialists have a responsibility here, they have to collect the feedback through the visits they pay to the relevant regions in order to learn and examine the performance of the products they deliver to the operation zones. Our companies are able take the support of our Undersecretariat in this respect and reach the regions they cannot access through its guidance. They need to identify the deficiencies, weaknesses and surely the superiorities through the feedback we receive from all units using these technologies and products and build the required reports as outputs and submit them to the Undersecretariat for Defense Industries".

Following his remarks, Küçükseyhan invited the SaSaD General Secretary Hüseyin Baysak to the stage to present the 2017 performance report compiled from the responses of 86 companies to the queries prepared by the SaSaD and which was distributed to all members and special members.

Mr. Yılmaz Küçükseyhan - The Chair of TOBB Defense Industry Council

2017 Total Turnover was $6.693 Billion

SaSaD General Secretary Hüseyin Baysak noted that critical developments occurred in the performance data of 2017 in respect to turnover, exports and employment and conveyed the following information to the council members: "In light of the data we collected from our 86 companies, I would like to say that this industrial performance reflects 90% and over depending on the profile of the participants. Unfortunately we could not collect the required information from the military factories and shipyards once again this year. However, as a result of the negotiations we made with the authorities, we assess that we will be able to gather the figures from these players in the upcoming years. We included the data we collected from these associations in the past years ($650 million) in order to avoid any changes in the figures. In concern with the Civil Aviation area, we could not collect the required figures from Turkish Airlines Technic and service providers either. We assess that we may reach different figures if we could add those figures to the performance report".

Underlining the fact that the Turkish Defense Industry achieved a turnover of $6.693 billion in 2017 Baysak added, "In 2017 a turnover of $6.693 billion was achieved. We reached this figure by adding the revenues of the military factories and

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shipyards ($650 million). We examine the figures of the Turkish Defense Industry in two categories; total domestic sales and total foreign sales. When we analyze the foreign sales figures of 2017, we see that a sale of $1.824 billion was achieved. In addition to the performance report of 2017 published by Turkish Exporters' Assembly (TİM) revealing a figure of $1.739 billion, our report displays that a sale of $84 million was achieved in light of the data received from our sector members as a foreign exchange gaining service. When we add this figure to total sales, we see that we achieved $1.824 billion of foreign sales in 2017. The total sum of the orders collected by the industry's players in 2017 was $8.055 billion, the amount paid to import items was $1.544 billion. The resources allocated to Product and Technology Development was $1.237 billion and the number of staff employed in 2017 was 44,740".

Land Platforms / Systems taking the greatest share within the total turnover

Touching upon the fact that they left behind a roller coaster year when comparing 2017 with the past years Baysak said, "While an increase of 12% was achieved in the total turnover, a 7% decrease was endured in foreign sales revenues. Despite the 3% increase in foreign sales figures compared with the previous year, as a result of the sharp decline in the services that gain foreign exchange, we lagged behind the figures of the year 2014 in 2017 in terms of total export figures. A new order of $11,9 billion was received in 2016, whereas in 2017 the new orders collected fell to $8.055 billion with a decrease of 32%. Imports increased in parallel with the increase in total turnover. In 2017 our imports were actualized as $1.544 billion with an increase of 20%. Yet, a decline of 2% was observed in Product/Technology Development".

Mentioning that the breakdown of the total turnover, Baysak reported that the sales of Land Systems was $2,36 billion, sales of Military Aviation was $1.132 billion, Weapon - Ammunition Missile System sales was $828 million, civil aviation sales was $660 million, Naval Systems sales was $569 million, total of MRO (military) sales was $171 million, Logistic Support Sales accumulated to $134 million , sales regarding Information Technologies was $47 million , sales related with security components was $47 million , CBRN sales was calculated as $19 million , Space Systems sales was $6 million and sales of other items was realized as $650 million .

Baysak mentioned that the total domestic sales constitute 70% of the total turnover, excluding the sales of the military shipyards and factories and continued, "When we analyze merely the turnover of our industrialists, of the sales reaching $4.222 billion, a portion of $3.427 billion is made to end customers, and $795 million is composed of the sales conducted to industrialists. The total share of foreign sales in total turnover was 30%. $1.137 billion of these sales were made to industrialists and $684 million of this figure is composed of the sales conducted to end customers. Our total foreign sales income was actualized as $1.825 billion. $1.739 billion of this figure was from the exports and the remaining $84 million was from the foreign exchange gaining services. In 2017, the sales conducted to America was $635 million with an increase of 8.5% (in 2016 it was $585 million), while the sales executed to Europe was $464 million with an increase of 3.3%. The sales conducted to the Middle East, Asia, Africa, South America and other countries were actualized as $721 million with a decrease of 21.5% in 2017 compared with the previous year (in 2016 the total amount of sales was $919 million)".

SaSaD General Secretary Hüseyin Baysak: "We observe the great potential of civil aviation in the total orders received in 2017"

Speaking of the development of the foreign sales figures over the years as well, Baysak emphasized that the compound yearly growth rate between 2012 and 2017 was identified as 2.32%. Baysak: "While the change of foreign sales figures compared with the year 2012 varied as 14% in 2014, 18.63% in 2015, 20.11% in 2016, 12.18% in 2017, we observe that the growth of 18.15% achieved in 2014 compared with the previous year started to lose momentum in the following years".

Underlining the decline of 32.39% in the total orders received in 2016, Baysak stated that the segment receiving the highest amount of orders was the Land platforms/systems similar with the situation in total turnover and that it was followed by civil aviation. Baysak: "We observe that

Mr. Hüseyin Baysak - SaSaD General Secretary

Undersecretariat for Defence Industries

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the civil aviation industry has the greatest potential. A total amount of $2.392 billion in orders were received in the Civil Aviation area. In the military area, Land Systems received $2.478 billion in orders, Military Aviation Platforms and Systems received $1.336 billion in orders, Weapon - Missile and Ammunition orders reached $990 million, and a total of $600 million in orders were received for Naval Platforms and Systems. 54% of the orders received were domestic orders, while 30% was received from the United States of America, 8% were received from Europe and the remaining 8% were received from other countries. 76% of the total domestic orders of the year 2017 ($4.343 billion) was collected from the end customers while 24% ($1.024 billion) was received from the industrialists. The total amount of foreign orders in 2017 was $3.712 billion and 78% ($2.886 billion) of this figure was received from end customers and the remaining 22% ($826 million) was collected from industrialists".

Conveying information on the breakdown of the total import figures of the year 2017, Baysak noted, "50% ($776 million) of our imports reaching $1.544 billion was from Europe, 35% ($536 million) of it was from the United States of America and the remaining 15% ($232 million) was from other countries. Our imports are composed of raw materials and end - products".

Turkey's Defense Industry Imports Fell to $1.067 Billion in 2015, then in 2017 this Figure Increased to $1.544 Billion

While Turkey's imports followed a roller coaster graphic in the years 2012 - 2017, it is observed that Turkey conducted an import of $1.327 billion in 2013, in 2014 the aforesaid figure slightly increased and reached $1.351 billion, and the imported raw material and products fell to $1.067 billion in 2015. The total amount of imports conducted in 2016 increased to $1.289 billion and the total amount of imports in the defense industry reached $1.544 billion in 2017.


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The Resources Allocated to Product and Technology Development by the Government Increased by $201 Million Compared with the Previous Year

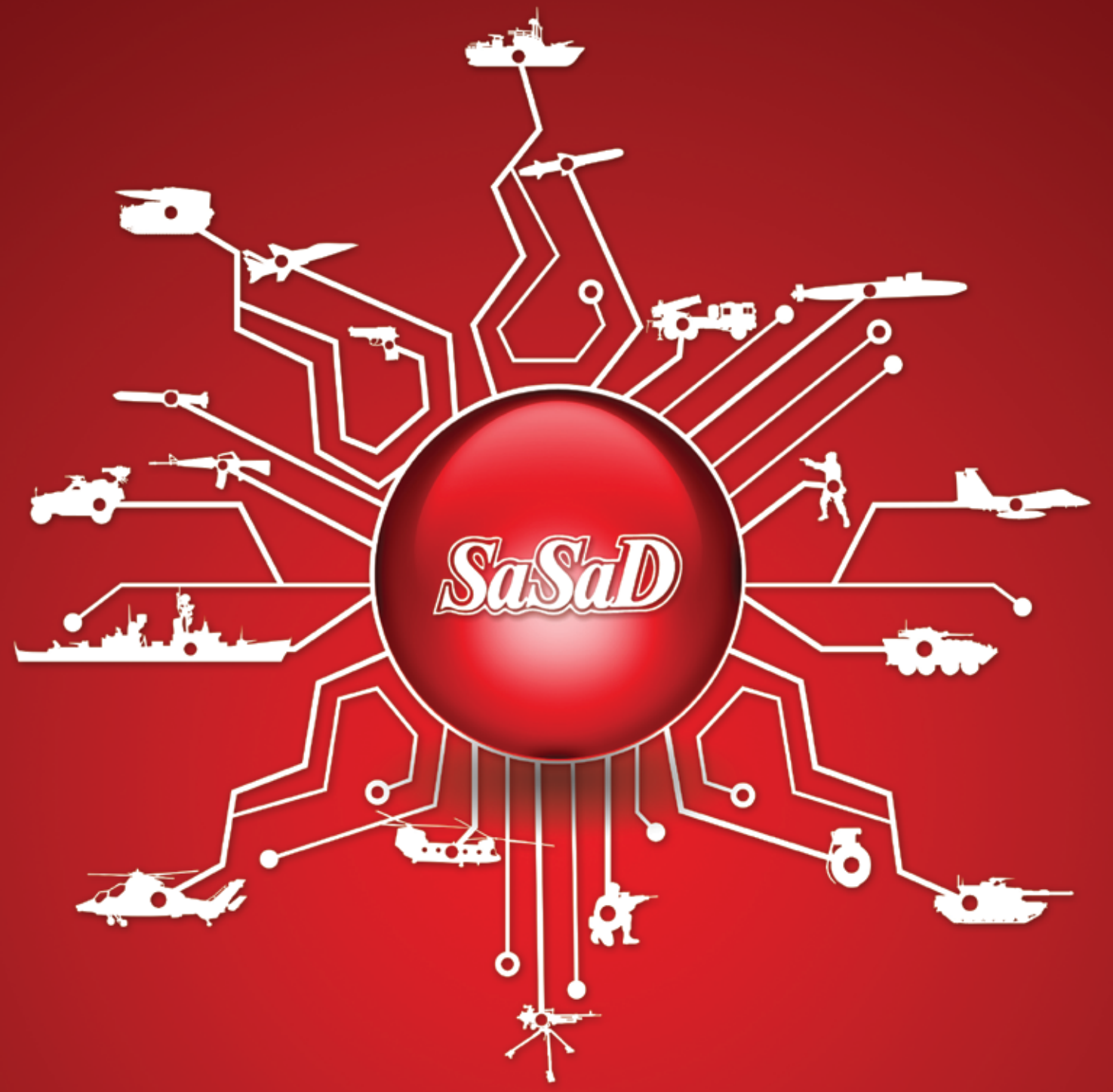
Also sharing the product and technology development figures of 2017 with the participants at the industry's assembly Baysak said, "We observe an expenditure of $1.237 billion was made to product and technology development. It is understood that a part of them were composed of project incentives provided through governmental resources. $242 million was allocated to total technology development and $995 million was allocated to total product development. A significant increase was observed in project incentives enabled by the government in 2017. The incentives and investments provided by the government was $741 billion in 2016, yet in 2017 this figure reached $942 million, and while the resources allocated through the equity capital was $513 million in 2016, it fell to $295 million in 2017".

From the pamphlet distributed to the members at the council meeting, an upward trend in the governmental incentives and investments was seen in respect to product and technology development especially since 2014 and the share allocated by the companies from their equity capital seem to follow a roller coaster behavior. The government allocated $537 million to product and technology development in 2014, $616 million in 2015, $741 million in 2016 and $942 million in 2017 as project incentive resources while the share allocated by the companies from their equity capital was $350 million in 2014, in 2015 it fell to $287 million, it increased back up to $513 million in 2016 and remained quite behind the governmental project incentives in 2017 with $295 million.

Sharing the data on total employment with the members of the assembly, Baysak said, "The total number of employed individuals reached the level of 44,740 and this figure being 31% of the overall figure is interpreted as an indicator of the intensity of technology production, design and development activities".

In light of the data shared with the public, of the 35% total employment level (15,709 persons) were employed in production, 21% (9,509 persons) were employed in Product and Technology Development, 42% were working in administrative and supportive units and the remaining 2% (752 persons) were employed in executive positions. According to the employment data, 62% of the engineers (13,703 engineers) employed by the defense industry were university graduates, 34% of them were post - graduates and 4% of them had PhDs.

Following the presentation of the 2017 industry performance report, SaSaD General Secretary Hüseyin Baysak made assessments based on the concrete outputs and said, "As a result of the severe fall



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in the oil and natural gas prices in 2016, the procurement of the countries with such reserves was effected and the related countries implemented significant cuts in procurement expenses. In light of both these developments and the political developments that occurred in parallel, a recession in the foreign market was observed in 2017 and despite all these aforesaid facts, the turnover of the industry in 2017 increased by 12% and this may be regarded as a positive development. We should not forget that, when considering the increase of 3.7% of the exports compared with the previous year, we may assess that the domestic market provided a crucial support in this given period. The hot environment in the region, the cross-border operations and the security measures at the country borders made important contributions to this development as well. When we take into the consideration that the sales volume of the Turkish Armed Forces establishments ($650 million) was reflected as they were similar to the previous years and that the civil aviation and MRO (Turkish Technic and other service operators) data could not be fully derived, this current turnover at the level of $6 billion would exceed $8 billion".

Emphasizing the requirement to open up to foreign markets to achieve the sustainability of the competencies acquired by the industry Baysak said, "Since 2014 there has been stagnation in exports in sales to foreign markets. In this regard, critical tasks fall to all shareholders of the industry as well as our Undersecretariat. There are certain implementations we suggest at various meetings toward increasing exports. State to state sales is one of them, our Undersecretariat spoke of the difficulties of this implementation many times but we observe successful examples of this method in foreign countries. On the other hand, in respect to the Barter implementation that appeared on the agenda in the last period, we see that the developments were not proceeding at the intended speed. Our Defense Industry companies have been spending amounts at the level of millions at international defense industry events for the promotion of their products and capabilities. Due to the insufficient incentives and support provided in this area, our companies, most of the time, do not even bother to apply for these incentives. We assess that the incentives and support for the events regarding the promotion of our special products and capabilities should be evaluated under a special status and the incentives should be taken into consideration within this context".

Baysak: "40% of the exports conducted to America and Europe is composed of Offset sales"

Baysak pointed to the upward trend in the employment figures of the industry and stated that this development in employment was achieved with the further extension of the business volume of the industry and this picture that is emerging at such a period where the rate of unemployment in the country increased gave a critical message in respect to the future of the industry. Baysak also mentioned that they assessed they will be soon receiving critical results from the SAYP program applied and extended by the Undersecretariat for Defense Industries toward facilitating the employment of qualified personnel and the regulation on the fellowships granted for studies abroad. Baysak stressed that the development expected on reverse brain drain has not been achieved yet and underlined that the government and industrialists should be conducting more effective activities to that end.

Expressing that the domestic market is expanding Baysak continued, "We are aware that the expansion of the domestic market is of vital essence for the extension of the Turkish Defense Industry. Within the scope of the report we prepared in 2014 on the modernization of the Turkish Armed Forces, we observed that the systems and products in the inventory were quite old, 30 - 50 years old. We believe that they should be replaced with new systems or be modernized. The activities to this end need to be accomplished immediately".

Underlining the severe decrease in foreign sales revenues as well Baysak said, "Approximately 40% of the exports we conduct to Europe and America are composed of sales arising from offset contracts. We witnessed a decline in the sales conducted as a result of business development and marketing activities of our industrialists in other regions, referred as the other countries and I would like to state that we are disappointed by this fall".

Baysak underlined that due to the increase starting in the natural gas and oil prices, the Middle East region regained its importance as a critical market and noted that as the country they were capable of conducting sales of platforms and products to countries of the Pacific - South Asian region and to the end customers, adding that the North African and Sub - Saharan African and Latin American countries would be critical markets for our country as well. Furthermore, Baysak expressed that they hoped the positive developments in the Middle East market and specifically with the United Arab Emirates and recent regression in the business potential which was acquired through the political developments in Saudi Arabia would pave the way for opening these markets to the industry again through the creation of a positive atmosphere.

Turkey's Export Sales - According to Turkish Exporters Assembly Figures, First Quarter 2018 is Booming to Compare to Previous Year

According to export figures revealed by the Turkish Exporters' Assembly (TIM), on May 1st, 2018 Turkey's defense exports for the period January 1st – April 30th, 2018 increased 17,24%, compared to the same period last year, and reached $594.649 Million. The Turkish Defense & Aerospace Industry's total arms exports amounted to $190.458 Million in April 2018, which represents a 38.3% increase compared to April 2017.

According to TIM's figures Turkish Defense & Aerospace Industry exported around 238.102 Million in defense and aerospace equipment to North America/USA, $159.463 Million to EU Member

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According to TIM figures the list of the top 10 countries that imported defense and aerospace products from Turkey during January 1st – April 30th, 2018 is composed of; the USA, Germany, Oman, the Netherlands, India, the UK, Azerbaijan, France, Switzerland and Italy. With a total of $232.646 Million in purchases United States was the largest recipient/ importer (mainly military and civil helicopter and aircraft parts, and component sales realized under offset commitments), followed by Germany with $71.563 Million, Oman with $70.724,740 Million, the Netherlands with $25.798 Million, India with $24.336 Million , the UK with $19.241 Million, Azerbaijan with around $10.566 Million , France with $9.999 Million, Switzerland with $9.978 Million , and Italy with $9.184 Million . Qatar on the other hand has imported $8.399 Million worth of defense and aerospace items from Turkey, which was merely around $988 thousand during the same period in 2017 thus represents a 749.77% increase, the largest one in terms of rate of increase.

Following the presentation of the defense and aerospace performance report of 2017, SaSaD General Secretary Hüseyin Baysak conveyed information to the participants on the products and systems that were prepared by Frost Sullivan in 2015 which will come up on the agenda until 2026.

Upon the completion of this presentation, the TOBB Defense Industry Council Chair Yılmaz Küçükseyhan shared his views with the members of the assembly. Küçükseyhan mentioned that they were preparing an industry report for June regarding the regions in which Turkey has markets, in which the Turkish Defense Industry is compared with the World Defense Industry and continued, "In this report we prepare, we will be revealing which countries dominate which markets with which products considering all regions. You will able to observe the direction of technology until the year 2020 in this report as well. We plan to publish this report by the end of June".

The agenda item regarding the asperities affecting the industry, the expectations of the main contractors, wishes and demands were shared with the participants by the Vice Council Chair Yılmaz Güldoğan. Güldoğan expressed that regarding the challenges affecting the industry and the wishes and demands of the main contractors, there were issues such as guarantee letters, export licenses, project implementation schedule, penalties for delays, intellectual and industrial property rights, warranties and force majeure events and added that the guarantee letters issue remained under the SaSaD suggestions regarding type contracts and that the Undersecretariat for Defense Industries conducted activities to this end, notifying the participants that the subject was considered affirmatively.

In concern with the export licenses that is another issue, Güldoğan stated that it was impossible to fully and clearly know the products subject to the export licenses during the contract stage especially in R&D projects and added that they demanded an easier and applicable approach to be found regarding this issue and that their demand was received affirmatively by the Undersecretariat for Defense Industries.

Güldoğan noted that in respect to the penalties for delays, they particularly focused on not implementing any penalties for the delays in intermediate deliveries and stated that they demanded the delay penalty to be assessed during the final delivery upon the completion of the project and informed the council members that their demand was assessed positively.

Vice Council Chair Yılmaz Güldoğan touched upon the requirement for limiting the damages to be compensated by the contractor in cases of the violation of intellectual and industrial property rights and concluded his remarks by stating that the warranty rates demanded in advance should be decreased to reasonable levels, adding that there were problems caused by the flow down of the contracts directly to the subcontractors.

Undersecretary for Defense Industries Prof. İsmail Demir: "We reached the signing stage of the mass production contract of the Altay Main Battle Tank"

At the conclusion of the TOBB Defense Industry Council Meeting, arriving at the hall after the networking break, Undersecretary for Defense Industries Prof. İsmail Demir made assessments on the industry's performance in 2017 and on the expectations for the year 2018.

Undersecretary Prof. Demir stated that the region Turkey is located in was a highly strategic region and especially nowadays considering the developments in the near future, a powerful defense industry fulfilling the requirements was critical. He pointed out the fact that there were increasing chronic issues since last year and rather than creating foresighted solutions to address these issues, instead conflicts, battles and developments causing suffering of people were endured.

Prof. İsmail Demir - Undersecretary for Defense Industries

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Prof. Demir stated that Turkish Defense Industry companies started exporting armored vehicles, air defense systems, rocket systems, simulators, military communication systems, command control systems and software to foreign countries and added that these activities increasingly continued in 2017 as well.

Informing the participants on the indigenous products included in the Turkish Armed Forces inventory and proving their success in the field Prof. Demir said, "Our Bayraktar and Anka UAV systems proved themselves at the field. They assumed critical tasks throughout Operation Olive Branch and in the fight against terrorism for providing reconnaissance, surveillance and signal intelligence. Besides, our UAV systems assume effective roles in neutralizing the terrorist. On the other hand, the delivery tests of the Long-Range Surface to Surface "Bora" missile and the low altitude Hisar-A and Medium Altitude Hisar-O air defense systems vertical launch test and 360 degrees protective firing tests were successfully accomplished as well. While over a thousand "Kirpi" MRAP armored vehicles were delivered to the military and security forces, over 300 "Kobra" and over 300 "Ejder Yalçın" armored vehicles were included in the inventory of the Turkish Armed Forces. In order to fulfil the powerpack group requirements of our land and air vehicles, we finalized the tender processes in 2017. We reached the contract stage of the mass production of the Altay MBT with the BMC Company. The number of delivered T129 "Atak" helicopters reached 34".

Prof. Demir noted that they accomplished the delivery of over 20 thousand MPT-76 Modern Infantry Rifles in 2017 and underlined that the R&D projects in which the system components were developed in order to be utilized in the projects and in electronic warfare, electronic support and electronic attack systems and projects were launched additionally.

Mentioning that the industrial strategy document for 2018 - 2022 has been published, Prof. Demir shared that projections for the future of the industry as well as the strategic aims, targets and the activities to be conducted to realize the aims and targets were included in the relevant document. The Undersecretary for Defense Industries added that they listened to the issues mentioned as part of the previous item of the agenda stating that the activities for their solution were on course and continued, "We are aware of the problems, but the repetition of the same issues also indicate the lack of concrete steps taken towards their solution. As the Undersecretariat for Defense Industries, we exert utmost efforts to launch various credit mechanisms and direct our advice regarding this issue to our executive committee".

Noting that they took certain solid steps regarding warranties, Prof. Demir continued, "In line with the directives issued within the Undersecretariat, our colleagues are taking the initiative in treating the companies in a more flexible manner. We believe that such an approach will pave the way for the industry".

Prof. Demir stated that following Operation Olive Branch, they received feedback on the systems and platforms utilized in the operation field and said, "I would like to mention that new projects and requirements came up on the agenda as a result of the feedback we received after this operation. Our companies' existence in the operation field is of vital essence, we observed this, too. Our companies with products in the field remained in the operation field throughout the operations. The Turkish Armed Forces and our security forces have their logistical support and sustainment activities but the actual existence of our defense industry companies in the field is quite critical and valuable. We believe that our security forces would be appreciating their value as our companies display their capabilities in the field".

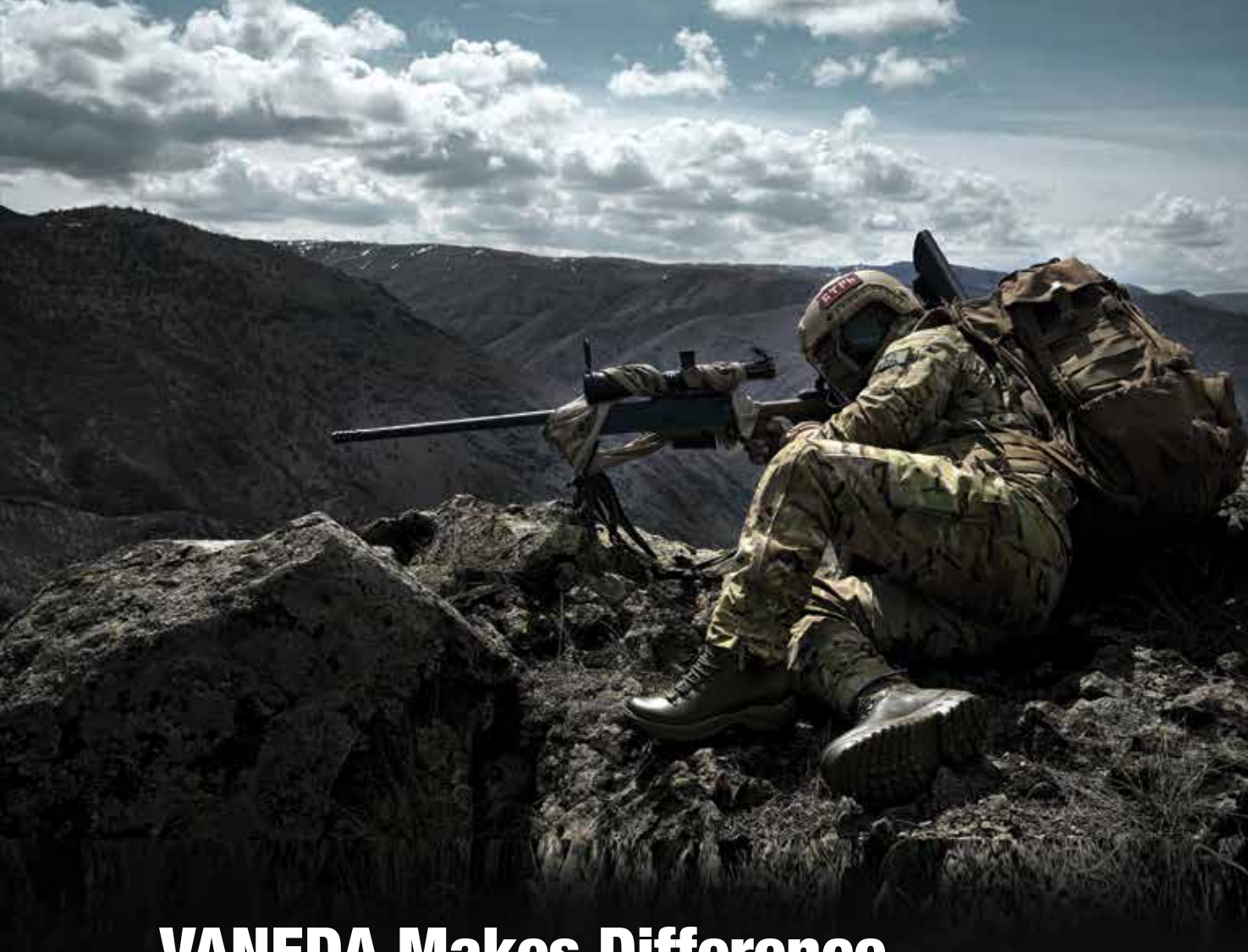
Underlining that the activities for technology development and human resources also continued, Prof. İsmail Demir stressed that the SSTEK became partners with 10 companies to this end and continued, "Our activities in a series of subjects ranging from rocket technologies to semi - conductive chips, from test infrastructure to communication systems, from camera detectors to various engine development projects continue. Through the protocol signed with Ziraat Katılım, we are building the infrastructure that will support such investments, become partners with them and carry them to the future".

Stating that the support they provide to the private sector in terms of loan services, R&D financing and industrial participation for infrastructural investments would be continuing in the upcoming term as well, Prof. Demir eventually expressed that the process regarding facility security clearance and production licenses gained momentum at the Ministry and the required steps towards solution were taken.

Regarding facility security clearance issue, Prof. Demir mentioned that not all the companies were obligated to acquire that certificate and added, "The requirement of all companies active in defense industry acquiring this facility security clearance is a huge question mark. For instance, why would a facility manufacturing bolts or valves for the defense industry require a facility security clearance? We express this constantly at all platforms and hope and expect this issue will be resolved".

Following the remarks, Prof. Demir expressed his gratitude to all participants and the council members of the industry and concluded his speech.

The meeting ended after the Q&A session held between the participants and the Undersecretary for Defense Industries Prof. İsmail Demir and the closing speech made by Council Chair Yılmaz Küçükseyhan.



VANEDA Makes Difference..

Ümral ORAL - Member of the Board of Directors VANEDA

We are continuing our journey that we started in 2004 in İstanbul İkitelli, with the same enthusiasm that we had in the beginning, continuously adapting ourselves to what's new, through research and development. With the philosophy of always aiming to produce the better, we participated in the projects of new design - new technology shoes and boots four years ago, with Turkish Armed Forces. Our primary aim in the boots and shoes we designed was not only foot comfort but also resistance in the most challenging conditions and usability in different weather conditions.

I would like to proudly announce that our New Generation Waterproof Shoes and Boots designed with Breathable Technology, which we developed thanks to the investments made and after two years of long, hard work, successfully passed the field and laboratory tests, and are now being supplied within the Turkish Armed Forces.

With this new technology, the shoes and boots remain water-proof and do not get wet and heavy in rain or snow, even in case of wearing them for long periods of time, dry quickly and thanks to its breathable design, prevent fungal infection of the feet. When required, they are designed to provide thermal insulation up to -38 °C for cold weather conditions, thus protecting the feet from cold. This will put an end to the problems suffered by our soldiers for years due to boots designed with outdated technology.

Our company, which proceeds with its investments at a fast pace, continues providing its services to the sector in the best way possible, at its new 5.000m^2 factory, with a manufacturing capacity of 500.000 pairs of boots and shoes per year.

It is obvious that our soldiers need the best equipment and mobility, especially in these hard times that our country is going through. I would also wish for other suppliers to support such projects and to aim to increase the mobility capacity of our army to the highest level possible.

“We Support Companies in the Defense and Aerospace Industry to Drive Their Digital Transformation”

An Exclusive interview with Elif Gürdal – Dassault Systèmes Turkey Country Manager

"Dassault Systèmes believes that value and experience today is important than products. They understand that the industry of the 21st century is a network of creation, production and exchange of experiences. They strongly believe that what we're experiencing today is a global Industry Renaissance. This era is bringing new ways of seeing the world, real and virtual, inventing, learning, producing and trading.

Like other industries, the Defense & Aerospace industry is going through a big transformation process. This process is surely rising with digital technologies.

Dassault Systèmes, the leader company in helping customers with the digital transformation processes and also supporting the Turkish A&D industry to drive their digital transformation in the most efficient way. They believe in Turkey; big national projects can be the major driver for this transformation. Dassault Systèmes thinks this kind of transformation can only be possible with the use of the state of the art - innovative technologies. In Turkey, they are working very closely with nearly all players and stakeholders, in order to help them achieve their business objectives."

Defence Turkey: Can you please brief us on how Dassault Systèmes positions itself in the A&D industry? In which direction do you think the industry is heading and what is DS's place in it?

Across the Aerospace & Defense industry, rising customer expectations like lower project costs, higher standards and increased capabilities, along with growing program complexity make it more challenging to compete. As systems become more complex to design, build and deliver, OEMs and suppliers need to accelerate innovation, drive efficiencies and move to the factory of the future to allow for greater production rate agility. And this surely requires a new way to conceptualize, design, manufacture, test, certify and sustain new air and space vehicles.

As a company that was born in Aerospace, we have a deep understanding of the challenges of the industry. All major players in the industry are already our customers and we are proud to see that the adaptation of our 3DEXPERIENCE Platform in the industry is very significant. Prospects for Aerospace & Defense companies appear bright with the continued growth of commercial aviation and the upturn of defense spending. Leaders must transform to navigate the landscape as new players use technology and non-traditional approaches to disrupt the mature aerospace industry.

Defence Turkey: Can you please elaborate on the challenges of the Aerospace and Defense Industry and how you address them?

One of main challenges is "growing global defense investment". An unprecedented period of defense modernization is occurring based on the growing global climate of instability. Countries around the globe are significantly investing in the development of more capable and more sustainable weapons systems to meet perceived threats and support a more modern defense force. This investment growth is expected to last through to 2024 and potentially beyond based on current budget projections.

Defense budgets are on the rise again, but concerns remain about the structural overhead and inefficiencies. Defense companies look to improve their traditional development models. Typically, this development approach carries high-cost structures (to carry the burden of cutting-edge development and compliance requirements), long development cycles and a limited ability to invest ahead of the market. Defense contractors must manage programs across the entire supply chain and improve on-time and on-cost delivery.

Defense contractors around the globe are incorporating advanced technologies into new weapon systems to achieve significantly greater effectiveness and versatility in manned and unmanned systems. Growing confidence in artificial intelligence, advanced analytics, new materials and advanced production methods will continue to improve system performance while driving down costs. Defense contractors must integrate these new capabilities to deliver against modern warfighter requirements.

Our 3DEXPERIENCE platform allows teams to seamlessly collaborate across their enterprise and with its suppliers on programs from defining the initial requirements, developing the systems engineering architecture, developing a system Digital Mock Up (DMU), optimizing designs, planning manufacturing, and testing to complete certification, and more. The platform can help companies rapidly accelerate new programs from concept to takeoff while significantly cutting development costs.

Defence Turkey: Let's take a closer look at your solutions for the A&D industry. One of these solutions is called "Co-Design to Target". What are the main benefits of Co-Design to Target?

Dassault Systèmes solutions that support a global effort to significantly reduce the development cycles within Aerospace and Defense are all based on the 3DEXPERIENCE business platform. Referred to as Industry Solution Experiences (ISE), each major phase of a program is addressed including the conceptual phase, detailed design, testing and certification, manufacture, sales and operations. Each of the following ISEs delivers significant value individually, but the combined result will further accelerate industry transformation from concept to take-off.

Co-Design to Target is a solution that enables companies deliver aerospace programs on-time, on-target and to specification through managing all detailed design and testing efforts on a single platform. Today, over 50 percent of programs are delayed due to late stage issues being discovered in the manufacturing process which could have been prevented in the design phase and it is often very difficult to identify potential issues before the final system is assembled. Co-Design to Target allows Original Equipment Manufacturers (OEMs) to integrate disparate tools, organizations and processes into a single stream to optimize form, fit and function in an integrated System Digital Mock-up

(DMU). This System DMU can avoid many of the integration issues that significantly impact the cost and schedule of a program.

Digital continuity provided by the 3DEXPERIENCE® platform makes it possible to drive program convergence with a real-time view to Key Performance Indicators (KPIs) across all departments, sites and suppliers, making it possible to proactively keep programs on track.

I can shortly summarize benefits of Co-Design to Target as; Real-time program management, as stakeholders can stay appraised of program status with an instant view of all key performance indicators with full traceability to deliverables, which in return reduces the costs while improving the quality. Improving the overall program execution through multidisciplinary simulations to ensure delivery of performance, reliability and cost targets is another benefit. As a final point, our customers can achieve manufacturing excellence by efficiently integrating and validating engineering designs and manufacturing installation processes through functional digital mock-up to avoid costly late-stage issues.

Defence Turkey: Winning Program is another solution of yours. Which industry processes do you cover with it?

Since 70 percent of cost decisions made during a program's concept or preliminary design phase impacts 80 percent of total lifecycle cost, companies that make the right choices in this early phase will have the most success.

Winning Program allows aerospace and defense companies to define new offers or win new business by exploring 1000x more concepts virtually, optimize designs for cost, performance and manufacturability and ensure it can be delivered on-time and on-budget. Companies can conduct comprehensive analysis of required system engineering choices and conduct associated trade studies to fine tune the accuracy and fidelity of each proposal or offer. Winning Program also captures the end-to-end process, allowing companies to reuse key processes or elements while minimizing the time spent on tactical proposal and program management. Now aerospace & defense companies can spend more time on product innovation instead of proposal management.

Winning Program allows efficient and effective bid development, by creating and validating your proposal with fewer resources by leveraging a single platform. You can design the programs to be delivered on-time, on-budget, and on-spec using advanced simulation and visualization. At the same time, you can explore 1000 times more design options that best meet the requirements as well a budgetary and time constraints. You can also shorten ramp up cycle by validating concepts during the bid phase to reduce downstream detailed design and production efforts.

Winning Program increases success rates of new concepts and bid proposals by uniting the proposal authoring, concept alternatives definition and analysis trade process on a single business platform. Companies can develop the best proposal to meet customer requirements at the right balance of capability and cost.

Defence Turkey: Do you have solutions targeting the needs of SMEs (Small and Medium Enterprises)? Can you please explain how Dassault Systèmes can help SMEs and support them?

We know that today, small and medium Aerospace and Defense suppliers face significant pressure to improve gross margins, revenues and market share. The number of companies competing for business is rising while Original Equipment Manufacturers (OEMs) demand higher production rates while imposing just-in-time delivery of parts and systems requiring greater production flexibility from suppliers.

Our solution "Engineered to Fly" allows small and medium suppliers to grow their business profitably from bid to delivery whether they use it in their office or on the cloud.

Engineered to Fly helps aerospace suppliers win more business and more efficiently deliver on time, on budget, on target. Best in class engineering, simulation and project tools delivered on a single platform can improve productivity up to 40 percent while reducing total cost of ownership at least 15 percent.

Better execution of in-house processes begins with the storage of information generated from the beginning of the proposal process to the end. Because stored information is reused, companies spend less time on tactical bid management. In this way, companies can respond to a greater number of RFQs and RFPs in a more timely and cost-effective manner. In addition, thanks to the digital continuity provided by the 3DEXPERIENCE platform, the functions within the process (ie, sales, engineering, simulation, manufacturing, quality control) are integrated and the complexity of product development is reduced. Thanks to the digital continuity between functions or throughout the entire process, aviation and defense suppliers can achieve higher profitability by shortening the design time; Early identification of problems can lead to quality improvements, reduced number of spare parts, and optimization in production.

I'd like to mention that we have been an important partner of Turkish Aerospace and Defense SMEs for a very long-time year and we are always looking forward to helping them in their digitalization journey.

Defence Turkey: Turkish Aerospace and Defense Industry is carrying out many important defense and aerospace projects and the future plans look promising. How can DS support these projects and plans?

In Turkey, Defense and Aerospace Industry is receiving a special attention from the state and private investors. In order to increase the size of the industry, the ecosystem needs to be elevated as a whole. It is obvious that the big National projects can be the major driver for this transformation. As Dassault Systèmes, we believe that this kind of transformation can only be possible with the use of the state of the art - innovative technologies. Thanks to our technology and investments in Turkey, we are working very closely with nearly all players and stakeholders, in order to help them achieve their business objectives.

Defence Turkey: Would you like to convey any message for our readers?

Our vision is, as clearly explained by our CEO Bernard Charlès, is to provide business & people with 3DEXPERIENCE universes to imagine sustainable innovations capable of harmonizing product, nature and life".

Under the light of this vision, we are working rigorously as a team in Turkey, to create and support companies in Defense and Aerospace Industry to help them to create value for their customers. Our investment to the Industry keeps growing in locally and globally, which indicates our commitment to the entire ecosystem

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Anka Block-B MALE UAV System Starts Serving Turkish Naval Forces Command

On April 1, 2018 Turkey's defense and security procurement agency Undersecretariat for Defense Industries (SSM) announced via twitter that "Anka" Block-B MALE UAV is at the service of the Turkish Naval Forces Command (TNFC)

According to sources to meet TNFC requirements one "Anka" Block-B UAV System, consisting of three air vehicles, payloads and related ground segment systems, was leased by the SSM.

The "Anka" Block-B UAV System is serving the TNFC under a long-term leasing contract and as of May 7, 2018 there are only two air vehicles in the service and the third one would be delivered to the TNFC soon. The first two "Anka" Block-B UAVs are equipped with the L3 Wescam CMX-15D FLIR payload, but the third air vehicle will also have unique developed Aselsan's SARPER Synthetic Aperture Radar (SAR) payload in addition to CMX-15D. L3 Wescam's CMX-15D has been preferred by the TNFC. According to sources since Aselsan's CATS HD Electro-Optical (EO/IR) Reconnaissance, Surveillance and Targeting System is not ready to meet all of the end user's requirements and StarSAFIRE 380-HLD of FLIR Systems could not be procured from the US due to ITAR regulations, L3 Wescam's CMX-15D is preferred by the Turkish Naval Forces Command.

Contrary to the 118kg weight of Aselsan's AselFLIR-300T the CMX-15D weighs only 51.4kg. Aselsan's CATS, on the other hand, has a weight of 59kg. Deployed at Dalaman Naval Airbase the "Anka" Block-B UAV performed its first operational flight on March 27, 2018 over the Aegean Sea. According to the leasing contract TAI personnel deployed at Dalaman Naval Airbase are only responsible for flight (the take-off, flight and landing) and maintenance services but the payload (CMX-15D and SARPER) is fully under the control of TNFC personnel. Thanks to its long endurance and relay mode capability (able to extent existing LoS range) with a single sortie "Anka" Block-B UAV is able to cover the whole Aegean Sea. "Anka" Block-B can operate at a distance of up to 250km with line-of-sight (LoS) communications. Thanks to its GMTI/ISAR modes supporting both maritime and land surveillance the 80 kg (around 100kg with radome) SARPER SAR payload provides high resolution SAR/GMTI imagery even at cloudy weathers at a standoff range up to 40km and ISAR imagery at Maritime Surveillance Radar mode up to 70km. TNFC is planning to procure up to 12 "Anka" UAVs either in Block-B or in Block-S (negotiations for "Anka-S" is on-going) configuration, to be equipped with a FLIR payload and Aselsan's SARPER SAR payloads and further 10 "Bayraktar" TB2-S Armed UAVs.


© TAI

Designed, developed and produced by Turkish Aerospace Industries (TAI) under the Turkish UAV Development (TIHA/TUAV) Project, the "Anka" is a combat proven Medium Altitude Long Endurance (MALE) Class, UAV System. The "Anka" Block-B, upgraded and lightened version of Block-A aircraft, is 160kg lighter than the first "Anka" prototype and 100kg lighter than the "Anka" Block-A aircraft. Having a service ceiling of 30.000ft the "Anka" Block-B UAV has an endurance of 18 hours at 23.00ft mission altitude and 24 hours at 20.000ft mission altitude thanks to its increased JP-8 fuel capacity (530 litters [around 445kg] vs. 400 litters on Block-A). The ANKA Block-B UAVs has a 17.5m wingspan, 8.6m long, 3.25m height and has a 1,700kg take-off weight. It can operate at a distance of up to 250km, using line-of-sight (LoS) data-link system the "Anka" Block-B, has 720lt of payload volume and 250 kg payload capacity.

TurAF Receives 6 "Anka-S" UAVs

Meanwhile, According to SSM's tweets issued on March 16 and April 8, 2018 TAI has delivered four (two in each) "Anka-S" UAVs to the Turkish Air Force (TurAF). As of April 8, 2018, the total number of "Anka-S" UAVs that entered into the service of the TurAF has reached six (under two "Anka-S" Systems).

On October 25, 2013 TAI was awarded a US$290 Million contract by the SSM to deliver three "Anka-S" MALE UAV Systems with 10 aircraft (2+4+4), 12 Ground Control Stations and sufficient amount of radar based Automatic Take-Off & Landing Systems to be deployed two separate air bases to meet the requirements of the TurAF. Aselsan's share (delivering a total of 14 [including 4 spares] CATS FLIR payload and some avionics inculuding INS/GPS and radio systems) in this contract is valued at US$33.576 Million. Deliveries are expected to be completed in 2018. TAI will manufacture a total of 11 "Anka-S" UAVs and to deliver 10 of them to the TurAF. According to sources "Anka-S" UAVs of the TurAF currently deployed at "Anka-S" Squadron located at the TurAF's 14th UAS Base Command in Batman Air Base. But there is a plan to establish a second "Anka-S" Squadron in near future. ANKA-S Operation Center (Operation, Simulator ad Training Centre [OSEM]) has been established at Eskisehir.

According to images appeared on the SSM's social media account "Anka-S" UAVs are equipped with StarSAFIRE 380 FLIR payload rather than Aselsan's CATS FLIR. However, according to Aselsan only two Anka-S systems are equipped with StarSAFIRE 380 FLIR, remaining Anka-S UAVs are being equipped with CATS FLIR payload.

Kaplan and Pars Tracked and Wheeled Type Anti-Tank Vehicle Design Phase Accomplished by FNSS

The first prototype of the "Kaplan" tracked weapon carrier / anti-tank vehicle the production of which was completed in January, continues its validation activities successfully. The vehicle's qualification tests will begin in the next stage and after testing completion, the mass production phase will start.

"Kaplan" is being developed within the scope of the Weapon Carrier Vehicle Project Contract signed between the Undersecretariat for Defense Industries and FNSS on June 27, 2016 and effective as of October 14, 2016. The contract covers the procurement of a total of 260 Armored Anti-Tank Systems in tracked and wheeled configuration, designed and produced with "national and local" capabilities.

According to the project plan, the detailed design of the vehicles was examined and approved by SSM and Land Forces Command within the 15th month of the project schedule. This means that the production activities have started as per the classical project methodology. In addition to detail design, FNSS has produced the first tracked vehicle prototype and launched the Anti-Tank Remote Controlled Turret (UKTK) for the users confirmation as well as initiated the factory tests. The 15-month period for the production of the prototype is noteworthy in terms of a short time span and it is considered to be a record among recent similar projects in the world.

The first prototype of the "Pars" 4x4 Anti-Tank Vehicle, which is the Wheeled type Anti-Tank Vehicle Project is scheduled to be completed in April and the validation tests are scheduled to be initiated in May.

The mass production of both tracked and wheeled type vehicles developed within the scope of the Anti-Tank Vehicle Program is planned to be completed in 2021 and all 260 vehicles will be delivered to the Land Forces Command.

FNSS Marketing and Programs Group Head Aybars Küçük said the following about the point reached in the Project: "FNSS has defined the standards of the upcoming period in the field of tracked armored vehicles with the 'Kaplan' product family. We are proud that the transformation of the "Kaplan" Tracked type Anti-Tank Vehicle, the smallest member of our 'Kaplan' product family, from requirement into reality in 15 months. Our Land Forces Command determined its requirements by defining a unique concept. Our Undersecretariat for Defense Industries designed the project in such a way to ensure that this need is met in the most efficient way and to obtain a national and local solution. The task was awarded to FNSS with the tender executed by SSM. I am confident that with this acceleration we achieved in the project, we will be able to successfully complete the qualification and progress to the mass production stage very quickly. We will introduce capability that will attract the attention of the world's armies to the Land Forces Command".

"Kaplan" - Tracked Type Anti-Tank Vehicle

"Kaplan" is a new generation armored combat vehicle with an automatic gearbox, having joint operation capability with main battle tanks. The vehicle has a platform design that allows it to perform all kinds of missions by integrating different subsystems.

Kaplan-10 WCV

Developed for carrying an anti-tank weapon system, "Kaplan" is the most modern of its kind among worldwide armies. It has mine and armor protection and was designed as a platform that can be used also for different missions thanks to its low weight. It was equipped with a loaded anti-tank missile and coaxial 7.62 mm machine gun through the anti-tank weapon system developed with modern shooting and command control capabilities.

"Kaplan" has a low silhouette and with its twin 5 road wheeled tracks it has the ability operate under hot/cold weather conditions at high speeds not only on asphalt and stabilized highways, but also on soft soil and rough terrain.

"Kaplan" Tracked type Anti-Tank Vehicle is one of the very few vehicles in its class having amphibious characteristics. Thanks to the two water propulsion systems located at the rear of the vehicle, it can perform in deep and fast flowing waters. The hull of "Kaplan" is manufactured and integrated using a ballistic welding technique. While the driver area expanded with power pack cabin is located at the front of the vehicle, the gunner and the commander areas are located in the middle of the vehicle. The rear part includes the gunner's aid and additional crew sections.

Projects Decisions Valued at $4.8 Billion at the Defense Industry Committee

The Defense Industry Executive Committee gathered at the Presidency Complex on the 29th of March, 2018 under the chairmanship of President Mr. Recep Tayyip Erdoğan to discuss the issues on its agenda.

During the meeting, 29 projects with a total cost of $4.8 billion (nearly 19 billion TL) were evaluated and concluded regarding new additions to the local and national systems used in the field by the Turkish Armed Forces and security forces that have been performing successful operations within Turkey's borders and cross borders. The meeting also focused on various investment and improvement activities aimed at developing, strengthening and supporting the defense industry.

No official statement was made after the meeting regarding the projects evaluated and concluded; only the Undersecretariat for Defense Industries made a written statement announcing that 29 projects were evaluated and concluded.

TÜBİTAK-Bilgem and Yital A.Ş. to Cooperate in the Field of Semi-Conductor and Microelectronics

In order to perform activities related to micro and nano-sized devices containing semiconductor and similar technological materials, a cooperation agreement was signed on May 9, 2018 between TÜBİTAK-Bilgem and 'Yital Mikroelektronik Sanayi ve Ticaret A.Ş.' 51% of which belongs to Aselsan, 29% to TÜBİTAK and 20% to the Undersecretariat for Defense Industries.

TÜBİTAK-Bilgem President Prof. Hacı Ali Mantar, Business Development Vice President Mr. Orhan Muratoğlu and Bilgem's senior executives and Yital A.Ş. General Manager Dr. Atakan Peker attended the signature ceremony.

Yital A.Ş. General Manager Dr. Atakan Peker: "Studies will lead the development of technological capabilities"

Dr. Atakan Peker, who signed the agreement on behalf of Yital A.Ş. expressed his pleasure in the cooperation made with TÜBİTAK-Bilgem at the ceremony. Stating that these studies will contribute to the formation of a semiconductor and microelectronics industry in Turkey, Dr. Peker added that the studies to be carried out will lead to the development of technological capabilities.

Dr. Peker stated that among the near future targets of Yital A.Ş., the production, packaging and testing of critical microprocessors that are designed in Turkey without the need to send them abroad and continued: "We regard the semiconductor and microelectronics industry within a national ecosystem and we want to work towards a common goal with all stakeholders, including the clients. Within this context, we attach great importance to the close cooperation with TÜBİTAK-Bilgem and we believe that the protocol we have signed is an important step to this end."

Yital A.Ş., the company registration of which was made with 17 million 462 thousand 500 Turkish Liras capital, is expected to proceed on its way as a "trusted semi-conductor production house."

TÜBİTAK-Bilgem will Enhance its Studies on Semi-Conductors with Yital A.Ş.

Within its structure, TÜBİTAK-Bilgem hosts the only center in Turkey that makes whole circuit production in semi-conductor technologies for use in the field. In the 800 square meter laboratory, a clear room space where all designs necessary for the whole circuit production is available. It is possible to perform all processes of mask production, wafer processing, wafer probing, packaging, circuit testing and aging process.

With the agreement signed, the semi-conductor studies will continue to expand.

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Launch Meeting of the Industrial Competency Assessment and Support Project (EYDEP) Held in Ankara

The launch meeting of the "Industrial Competency Assessment and Support Project" (EYDEP) was initiated by the Undersecretariat for Defense Industries. The purpose is to render companies active in industry as qualified suppliers for the defense industry. Execution of situation analyses and building development plans was held in Ankara with the participation of Prime Minister Binali Yıldırım, Minister of National Defense Nurettin Canikli, Undersecretary for Defense Prof. İsmail Demir and many invitees.

Taking the floor at the launch meeting, Undersecretary for Defense Prof. İsmail Demir stated that the EYDEP program is not considered a grant or support, and instead the aim of the program is to gain new players to the defense industry and thus form a robust supply chain. Prof. Demir continued, "We have to increase the quality in the defense industry and become a country manufacturing indigenous products worldwide. In order to achieve this, we have to reach the level of excellence. Our companies used to have difficulty in launching this vision, so we provided training and consultancy to this end and reached the following conclusion as a result of our assessments: We need to evaluate whether our companies are players on global scale or not. We have to identify their inadequacies and clarify which type of support, training and consultancy needs to be provided. We wanted to provide support in areas of equipment or software and we took concrete steps to this end with this launch meeting. We trained our supervisors within the scope of the EYDEP program and they reached the competency to supervise our companies. This program will continue to grow and extend with the participation of organized industrial sites and clusters. Our main industry companies, even the global defense industry companies will be able to build long term business relationships with the help of this program. We hope to create a competent sub-industry, sub-system manufacturers and a growing global defense industry of companies in Turkey."

Prof. İsmail Demir - Undersecretary for Defense Industries

Minister of National Defense Nurettin Canikli expressed that the product groups with high added value are mostly within the scope of defense industry and added, "In addition to the conventional products, we should develop, manufacture innovative products with high added value that could be sold with higher prices and introduce them to the world market. We have to build a structure that is capable of producing the defense industry products manufactured and developed in Turkey, from their sub-systems to their components in the most micro level. There are cases where one of our defense industry companies has to develop a micro component from scratch that was previously developed by another company as part of a defense industry company. All these from the micro level to system level should be defined jointly, their characteristics should be identified and eventually a joint data repository should be formed. In order to have comprehensive knowledge, we have to have a good command of all details."

Prime Minister: "The budget allocated to the EYDEP Program has to be increased"

Mr. Binali Yıldırım - Prime Minister of Turkey

In his speech at the ceremony, Prime Minister Binali Yıldırım mentioned that the world has entered a new era where Industry 4.0 and virtual reality are at the forefront and added that if Turkey achieves a rapid transition into the Industry 4.0 concept in the production area, it may be able to increase its added value minimum 2.5 times. Underlining that according to their 10-year projection, $60 billions of business volume and 600 projects are expected, Yıldırım stated that while executing these projects, they need to form competent companies and a strong defense industry eco-system. Emphasizing the importance of identification of the inadequacies and their fulfillment in respect of building companies that are competent in their areas of activity, Yıldırım underlined that the support provided to this end and the budget allocated to this Project should absolutely be increased.

In his presentation, Bilal Aktaş - Head of the Industrialization Department of the Undersecretariat for Defense Industries remarked: "The EYDEP aims to assess companies in order to prepare the industrial competencies of defense industry companies and support the development of the companies in line with these assessments. This program was prepared based on the development criteria identified for domestic and foreign main contractors and subcontractors. The assessment results will be shared with all shareholders via the portal established. Identification of the technology and subsystems that are aimed to be gained by our country in the upcoming period for the owners of technology and subsystems for a sustainable defense industry, determination of the strategic aims and targets for each industry by setting visions for the future in respect of the industry and identification of the activities to be accomplished to realize such targets are included in the defense industry's industrial strategy document. The EYDEP schematic will also be used in the realization of the activities contained by the defense industry strategy document. The objective of the EYDEP assessment is composed of the preparation of the competency inventory, its rating and reporting to the shareholders. Our support topics are consisted of certification, R&D and patent management, institutionalization, documentation activity, mentorship and training. Through this program, every company's manufacturing of a unique, indigenous product, indigenization of critical products which are difficult to import, production in international standards and their competition in international market are aimed. A budget of 50 million TL was allocated for the execution of the EYDEP processes, and upon today's directive of our Prime Minister this amount will increase further. We believe that EYDEP will at the same time act as leverage for the coordination of the industry with governmental institutions that provide support."

Sharing critical information also on the evaluation and approval processes Aktaş continued: "The process regarding evaluation, starting with the companies registered to the defense industrialization portal - but not limited to them - is composed of collection of the demands of the companies wishing to pass through the EYDEP supervision process, assignment of the supervisors who will be conducting the supervision and assessment, planning, visits, assessment and preparation of the assessment reports. The assessment survey sets are composed of five different survey sets varying on the activity areas of the companies. Their content and titles have a flexible structure that may be changed depending on the industry. General and common queries are directed to all industries; and the questions in the subcategories related with the analysis of production competency, design competency, software competency, production - design competency and system competency provide us great advantages in getting a clear picture of the company."

Mr. Bilal Aktaş - Head of the Industrialization Department of SSM

Bilal Aktaş "Involvement of 100 more supervisors are planned for inclusion in the 2018 program"

Stating that within the scope of the EYDEP program, 110 supervisors from 6 industry companies and the Undersecretariat for Defense Industries and Ministry of Defense were trained up to date, Aktaş said, "110 supervisors were trained on a total of 17 subjects. 60 courses were provided, and these supervisors were trained by 25 trainers. The participation level in the courses was 85% and 60 companies were visited by groups of a minimum of five people in order to conduct common assessments by 110 supervisors. When their training is completed, we plan to include 100 additional supervisors in this program in 2018 as well."

Evaluating that the most concrete output of the EYDEP program was the report, Aktaş continued his speech: "On account of the EYDEP report, the companies will be able to see their strengths and weaknesses. In addition to this, opportunity analysis, capability matrix, potential products to be indigenized, special products, technology and investment areas

in the defense industry and the radar graphics to be shared with the company will be covered in this report. The support model will be approved by the EYDEP high council with the requirement analyses of the companies upon the collection of the assessment reports and service procurement will be made through a contract signed by SSTEK which is an affiliate of the Undersecretariat for Defense Industries and a company which will fulfil all the demands of the company and this process will be monitored by a mentor, similarly it will be reported to our industrialization portal and the impact analysis of the support provided will be monitored as well. Through this support model, we aim to transform our companies to technology manufacturing companies owning their unique products from mere technology users. With the help of this program, we wish that each of our companies would be recalled with a unique product."

The EYDEP Launching Program ended with the signing of cooperation protocols between the Undersecretariat for Defense Industries, KOSGEB and Savunma Sanayi Teknolojileri AŞ and the signing of a general protocol by the Undersecretariat for Defense Industries, Aselsan, Havelsan, FNSS, MKEK, Roketsan and TAI companies and the signing of an EYDEP subcontractor representation agreement by the Undersecretariat for Defense Industries and SSTEK.

EYDEP aims to find out to what extend the companies in the defense and aerospace industry fulfil the requirements of the industry, to identify the level of their industrial competence, their level of preparation for technology development and the indigenization processes within the scope of a common perception.

With the EYDEP program, the capabilities and administrative/ technical/ financial capacities of the companies will be revised through a unique point of view and this data acquired will be regularly submitted to the shareholders along with the classification to be made in sublevels and the scores. As a result of this activity, the map of the competence levels of companies in various subjects can be prepared as well as the reports can be written on which areas the companies need to develop for their active participation in the defense industry (for industrial sustainability). Based on these reports, the development and support strategies for the evaluated companies will be built and support mechanisms related to these strategies will be launched. With the assessments to be conducted in regular periods, the given company's progress over time, its development, the stages it goes through and the efficiency of the support programs can be monitored in detail. Moreover, it is regarded that this project will add quality to the assessments made due to various reasons over time by the main contractors and they will be integrated to these assessments.

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The program was initiated to minimize the foreign dependency in the defense area and it aims to institutionalize the capabilities separately and extend them throughout the industry. Through the acquisition of high quality products and technology development competencies by companies through these programs, the goal is the elimination of obstacles that stand before the domestic production of products and systems based on high technology required by the sector.

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Retinar PTR Takes Part in the Turkish Armed Forces (TAF) Inventory

The Retinar PTR Surveillance Radar, developed by Meteksan Defense with national facilities, has entered the TAF's inventory. The Retinar PTR, which has been used by the security forces in the field for quite some time now, received its first order by the Land Forces after proving its successful performance. Thanks to the entry of the Retinar PTR Surveillance Radar into the inventory of the Turkish Armed Forces, the awareness of the elements of the TAF in the operational field has been further strengthened.

In the last quarter of 2017, Meteksan Defense made the first export contract of the Retinar PTR, the lightest member of the Retinar family, with a nondisclosed country. The deliveries are scheduled to be completed in the first half of 2018.

Retinar PTR - Agile Surveillance Providing Swiftness in the Field

Retinar PTR is the man-portable model of Meteksan Defense's Retinar Perimeter Surveillance Radar Family. It is small in size and light weight. The high-technology radar system was developed for use in surveillance operations such as perimeter security of critical facilities, border security, and agile surveillance carried by patrolling mobile personnel.

The system stands out with an enhanced user interface, compact structure, lightness and low power consumption. With its total weight of twenty-five kilograms, it can be carried operationally by two personnel in its special backpacks and can be used in a mobile capacity on a tripod with its batteries. The radar consists of a small size antenna and signal processing units integrated to the antenna and it is connected to a pan/tilt unit. This configuration can be installed in less than 5 minutes. For mobile operations, 2 - 6 battery blocks can be carried in backpacks depending on the period of use. The system also has an optional portable power supply/battery charging unit that can be fed from any kind of power source. The user can operate it with two battery cartridges for almost 8 hours. This in turn provides swiftness in the tactical field.

Through its special Wi-Fi antennas, Retinar PTR can be remotely controlled from a distance of up to 1 km, and it has the ability to communicate with smart phones and tablets via special mobile apps. Retinar PTR can be easily integrated with all camera systems, and it features slew-to-cue for cameras and stabilized weapon platforms.

It also generates the doppler signature of the target and provides classification information whether it's a vehicle, human or animal with micro-doppler spectrogram analysis. With this specification Retinar PTR, mobile objects that are the size of a human or an animal can detect, track and classify from a distance of 4 km, as well as vehicles from a distance of 10 km with minimum error.

The Product Range of Retinar

The Retinar PTR-X Surveillance Radar, designed for stationary use at critical facilities or on vehicles, removes the dependency on operators of the security forces working with conventional camera systems and of civilian security institutions as well as eliminates possible errors. With its advanced micro-doppler algorithms, it can detect the distant targets and transmit the information automatically to the operators, thus making possible to use existing camera systems more efficiently.

Retinar OPUS Surveillance Radar, the other member of this product family, stands out as a model which is fully integrated with the day / thermal camera systems of the Retinar PTR-X. The radar and thermal / day camera systems work with their own router units, without shading each other on a single mast. Thanks to the full integration of radar and thermal / day cameras, the system also provides superior drone detection and tracking performance to its users.

Turkish Armed Forces Reinforce the UAV Fleet with 8 Additional “Bayraktar” TB2 Armed UAVs

The inventory of the Turkish Armed Forces has gained strength with new armed unmanned aerial vehicles. “Bayraktar” has delivered 8 more Armed “Bayraktar” Tactical Block 2 (TB2) for use by the Land Forces Command. New “Bayraktar” TB2 UAV’s and Armed UAVs have proven themselves in the operational field during Operation Euphrates Shield and Operation Olive Branch and were added to the existing inventory.

There are thirty-eight UAVs in the inventory of the Turkish Armed Forces and Security Forces; 23 of them are designated for Reconnaissance/Surveillance and 15 are in an armed configuration. Together with these recently procured systems, the number of “Bayraktar” TB2 Armed UAVs and reconnaissance/surveillance in the inventory of security forces has increased to 46. 46 of those in the inventory are serving the Turkish Armed Forces, 6 of them serving the General Directorate of Security and 6 of them are serving the General Command of Gendarmerie.

With this delivery realized ahead of schedule, the number of armed configuration “Bayraktar” TB2s in the inventory has reached 23.

The Armed TB2 platforms, capable of carrying payloads of up to 150 kilograms, can carry low-weight laser seeker MAM-L and the smaller version of “Cirit” missile MAM-C smart munitions developed by Roketsan on the launcher beneath both wings. Armed “Bayraktar” TB2 was used for the first time during Operation Olive Branch with loaded with four MAM-L and the armor piercing and thermobaric capped versions of the MAM-L munitions also proved themselves for the first time during this operation. In addition, the MAM-L munitions with anti-personnel warfare were also tested for the first time in the operation.

Test and Demonstration Firings of 120 mm HE-T Tank Gun Ammunition Produced by MKEK

The development and production of 120 mm HE-T Tank Gun ammunition, which has not been previously produced in Turkey, was manufactured for the first time by MKEK

Within the scope of the requirements of the Turkish Land Forces Command for 120 mm HE-T Tank Gun Ammunition, which can be effective against open and sight defilade targets, the unique 120 mm HE-T tank gun ammunition was developed and produced in a short period of one year within the scope of the program of the MKE Institution, launched with its own resources.

Following the production of prototypes, the first test and demonstration firings of the ammunition were performed through M60 Tank on April 03, 2018 under the supervision of MSB Firing Range Test and Evaluation Group Command.

National Defense Minister Mr.Nurettin Canikli: "120 mm HE-T tank gun ammunition was produced locally and nationally with all its sub-components"

National Defense Minister Mr. Nurettin Canikli made a statement to the public after the test firings about the features of 120 mm HE-T tank ammunition: "In our country, 120 mm HE-T tank gun ammunition, which has not been produced before, has started to be produced by the MKE Institution. The 120 mm HE-T tank gun ammunition, which is very effective against open and sight defilade targets and which can be used by the tanks in urban operations especially known as proxy wars, was achieved as a result of an R&D project conducted by the MKE's own resources. Since the tank gun is used against armored targets according to the conventional operation concept before today's proxy wars, MKE has been producing armor piercing tank ammunition for this purpose until now. It developed 120 mm HE-T tank gun ammunitions during a period that could be considered very short in such studies, with the R&D project conducted by MKE against the changing target concept in Operation Euphrates Shield and Operation Olive Branch. With this project, MKE has gained the ability to produce 120 mm HE-T tank gun ammunitions together with all its sub-components locally and nationally. Following the production phase of prototypes, the design activities of which were completed in a short period of time, the firing tests were performed successfully. The certification and firing table preparation studies of the newly developed tank gun ammunitions are still ongoing. For the 120 mm HE-T tank gun ammunition, serial production will begin in the second half of 2018 and three thousand units will be delivered to the TAF this year. With this production to be made for the first time, 120 mm HE-T tank gun ammunition, which our army requests during operations but is difficult to import from abroad, will be provided domestically."


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Following the first firing tests of the ammunition, high and low temperature tests (+520C,-440C), design strength, wall drilling and fuse effectiveness tests conducted at the Konya / Karapınar MSB Firing Test Range and Evaluation Group Command were also successfully accomplished. Following this process, the qualification tests will take place.

For the 120 mm HE-T Tank Gun Ammunition, the aim is to start serial production in the second half of 2018 and three thousand units are scheduled to be delivered to the Turkish Armed Forces in the first phase.

The 120 mm HE-T Tank Gun Ammunition, which can be used in smoothbore weapon systems of a total length of 945 mm, a full thrust weight of about 27 kg, a muzzle velocity of up to 1050 m/s and an effective range of 4000 m in 120 mm tank gun munitions, can be used with 44 caliber M60T and Leopard 2A4 gun barrels.

Roketsan at Eurosatory with High-Tech Missiles and Smart Munitions

Aiming to boost its export figures with the indigenous state-of-the-art products, already entered services of the both Turkish and a number of foreign Armed and Security forces, Turkey's rockets and missiles centre of excellence Roketsan displays its state-of-the-art products at its stand during Eurosatory 2018, the only international exhibition 100% dedicated to land and air land Defense and Security, takes place from 11-15 June 2018 at Paris Villepinte

Mock-ups of CIRIT (named after a traditional Turkish cavalry game) 2.75" semi-active laser (SAL) guided rocket, the Smart Micro Munition (MAM-L), SOM Next Generation Air Launched Cruise Missile Family, Anti-Tank Guided Missile Family comprising UMTAS long range and OMTAS medium range anti-tank guided missiles with SAL and IIR guidance, 122mm and 107mm unguided Artillery Rockets, T-122/300 Multi Caliber and Multi Barrel Rocket Launching (MBRL) System, TRG-300 TIGER Missile System, TEBER Laser Guidance Kit as well as ASW Rocket and Ballistic Protection Solutions are among the products being showcased at Roketsan stand.

SOM - Stand Off Missile

SOM Next Generation Air Launched Cruise Missile Family

Stand Off Missile (SOM) is a next generation air launched cruise missile (ALCM) family against highly defended stationary and moving land/surface (ASuW) targets. Its modular design supports operational flexibility.

The first flight test of SOM was performed in 2011 and serial production started in 2013 under the contract between Roketsan and the Turkish MoND. As part of the serial production frame the production line qualification has been completed and the first batch of missile deliveries with the components of the SOM Missile System, including the Test & Programming Unit and the Captive & Dummy Training Missiles, have been successfully delivered. Further capability enhancement activities are still in progress within this contract.

A contract for the in-house development of a smart munition compatible with the F-35 Joint Strike Fighter, which will be based on the existing SOM technology, was signed in 2012 between Roketsan and the Undersecretariat for Defense Industries (SSM). Within this scope, SOM-J development activities besides the platform integration studies in collaboration with Lockheed Martin Aeronautics, the Prime Contractor of the JSF Program were initialized in 2014.

A business partnership agreement was signed with Lockheed Martin Missiles and Fire Control (LMMFC) for the design, development, production and marketing of the SOM-J Weapon System in 2014 and the contract was signed in 2016. The integration activities of the F-35 are being carried out by Lockheed Martin Aeronautics, and these activities are scheduled to be completed in 2023. The SOM-J, specifically developed for intensively protected targets, developed for the F-35 aircraft, for sea and land targets, will be carried inside the airframe so that the aircraft maintains a low radar signature.

The SOM ALCM provides availability for adaptation to various missions due to its open architecture software. Composite materials are used within its structure and the radar absorbing material enables low visibility. The SOM provides the advantage of smaller size and weight, compared to similar systems with a 250+km range for the SOM and a 200+km range for the SOM-J. The SOM operational concept will be enhanced by in flight re-programming and network capabilities to be enabled by the integration of a data link.

Currently, SOM ALCM supplies the selection among pre-planned missions and controllable impact points and parameters. SOM-A and SOM-B1 defeats the targets by a high explosive blast fragmentation type warhead, while SOM-B2 and SOM-J carries a dual stage tandem penetrator and a semi-armor piercing type warhead respectively. In addition to inertial navigation, global positioning and terrain referenced navigation systems SOM-B1, SOM-B2 and SOM-J are equipped with an imaging infra-red (IIR) seeker with

Automatic Target Recognition/ Acquisition capability. SOM-A and SOM-B1 have been certified for the F-4E 2020 and F-16 platforms and already entered Turkish Air Force (TurAF) service. Qualification and certification flight tests for the SOM-B2 are currently ongoing.

TEBER Laser Guidance Kit

Named after a historic double-sided axe, TEBER is a low-cost guidance kit that turns standard Mk-81 (250lb) and Mk-82 (500lb) series free-fall general purpose bombs into precision-guided munitions through the addition of a Laser Seeker, Global Positioning System (GPS), Inertial Navigation System and control fins.

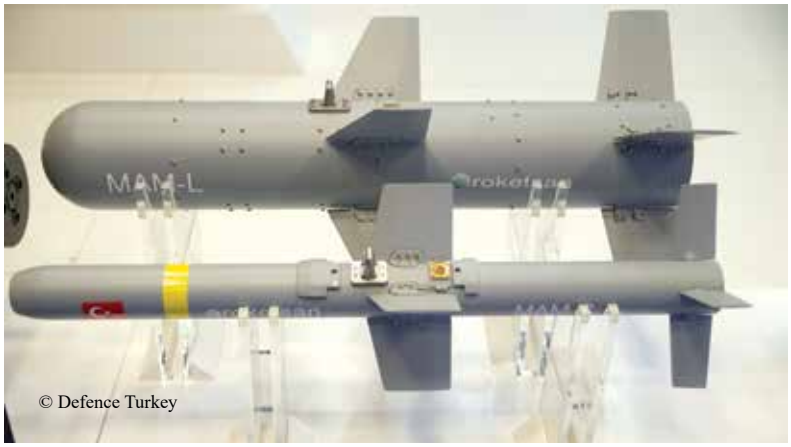
TEBER's modular design offers affordable options. An add-on Laser Seeker, which is located on the front section allows precise impact capability for moving land and surface targets even if the target is maneuvering at high speeds. The Laser Seeker may be equipped with or without a Height of Burst seeker.

The TEBER tail kit can identify the bombs (MK-81/MK-82), which are integrated, and it can be installed very quickly in the field with the Laser Seeker. Tail kit contains a GPS/Inertial Navigation System for precise guidance and aerodynamic control surfaces. Body Strakes supply additional lift and stability and the weapon maneuver capability.

TEBER offers capability against moving land and surface targets travelling at speeds of up to 110km/h and has been certified for TurAF's F-16 fighters. Roketsan is also targeting other NATO fighter types, such as Rafale and Typhoon, as well as non-NATO platforms including the MiG-29. On the other hand, efforts for the integration of TEBER-81 and TEBER-82 on ANKA MALE UAV are currently ongoing.

MAM-L Boosts Effectiveness of UAVs

Designed, developed and produced by Roketsan in line with today's battlefield requirements, the Smart Micro Munition (MAM-L) is primarily intended for carriage by UAVs, although it could also be employed by manned light attack and close air support aircraft.



MAM- L and MAM-C Smart Micro Munitions

The MAM-L, a variant of the Laser Guided L-UMTAS with Semi Active Laser (SAL) seeker of CIRIT Laser Guided Rocket has already been integrated on the Armed ANKA MALE UAV and BAYRAKTAR and KARAYEL Armed Tactical UAVs, currently being used by the Turkish Armed and Security Forces. Both BAYRAKTAR TB2-S and KARAYEL-SU UAVs have recently secured export contracts and expected to be armed with MAM-L munitions.

The MAM-L, which is being successfully used in various operations involving UAVs, stands out as a munition that has proven itself in the field.

Having a weight of 50lb/22kg and a length of 1m, the combat proven MAM-L is an unpowered smart munition with a gliding range of 8km when dropped from 12,000ft/3,657m, and can be fitted with 1okg weight high explosive blast-fragmentation, anti-tank or thermobaric warheads. The MAM-L, with high explosive blast-fragmentation warhead is highly effective against soft targets, such as light structures, unarmored ground vehicles, radar antennas and soft targets like weapon pits and personnel, with a lethal radius of 25m. The other version with tandem anti-tank warhead is effectively used against hard targets such as Main Battle Tanks.

The MAM-L can be used efficiently at ranges of up to 8km, depending on the altitude from which they are released, and the range can be extended to 14km with the optional INS/GPS Version.

Meanwhile, the fact that MAM-L is a member of the same family as the Roketsan medium range anti-tank missile OMTAS and long-range anti-tank missiles UMTAS/L-UMTAS, offers significant advantages for users in terms of training and logistics.

Roketsan is also leveraging the experience in integrating MAM-L into air platforms. As long as the air platforms have the required infrastructure, Roketsan can operationalize the MAM-L by completing all the related integration works within a few months. In the event of the infrastructure requiring additional elements, the company also offers integration support.

"The design and application concept of the MAM-L provides its users with the capability of effectively neutralizing time-critical targets, particularly those that arise during reconnaissance and surveillance missions. Meanwhile, thanks to its precision guidance and small dimensions, the MAM-L offers a solution with low collateral damage. When compared with all the other capabilities of the armed forces, a combination of the MAM-L and a tactical UAV is the most cost-effective solution. We believe that soon other countries will also start taking an interest in this solution," Selçuk Yaşar, President and CEO of Roketsan, commented.

Building the Future Today – GES Engineering Turkey's Engineering Partner

An exclusive interview with Arzu Baytar- the Chairman of Board GES Engineering

Defence Turkey: Ms. Baytar, first of all we would like to thank you for your time. GES Engineering has been providing services to the aviation and defense industry since 2013 and it is obvious that GES Engineering is gaining momentum and growing rapidly due to its capabilities and technology. Could you please inform us on your facilities and personnel structure, engineering and design capabilities?

As you have also stated in your question; GES is gaining momentum and during this period it is really important to have a strong personnel structure. We have 67personnel currently and 22 of them are engineers. In line with the market needs we have 3 different divisions. A division established for Land Platforms, a division for Air Platforms and R&D division. Our Design & Development Capability is under our 3rd division.

Defence Turkey: Could you please share some information on your capabilities and products?

As I have stated in the first question; GES has a R&D Division which is responsible for developing and localizing products, systems and subsystems that are mostly used by main defense manufacturers, those that are being procured from other nations.

So, what we are doing is, we are examining carefully the real, small details within the main programs. Then pulling out one system or a subsystem which we believe is a strategic component for the overall system but not being manufactured in Turkey. Then we are concentrating on developing and manufacturing the related component, system or subsystem within our capability area which is mechanical and electromechanical manufacturing.

Defence Turkey: What are the projects that you have accomplished, and ongoing programs carried out with Turkish companies?

We are working very closely with the main defense manufacturers in Turkey especially on Land Platform and Air Platform Systems. I can give detailed information about the products we have developed when explaining our R&D Division's activities.

Defence Turkey: Your company possesses striking design and engineering capabilities. What would you like to say about your existence in the foreign markets and your collaborations with foreign partners?

Since we believe the importance of export for our country; we strongly give our attention and use our resources to expand this part of the business. We have had strong ties with several foreign companies since GES was established. We are an approved supplier for Knorr-Bremse, the German company with whom we are supplying fast-train brake parts as a serial production. There are also other foreign companies such as Feuerland, Dronco etc. which we are currently working with. We also have started to new collaborations with several foreign companies for some specific programs.

Defence Turkey: Could you please provide details about your new R&D activities, new products and new technologies? In which areas are you aiming to put forth products of superior technology?

We are currently involved in many development and localization projects, especially in the field of defense and aviation industries. Our first goal in this regard is to be able to offer domestic solutions for the needs of the main contractors and export our products. In this context, we have first localized the pallet tensioning system used in tanks; at this point we have completely removed our dependence on foreign countries. All of our products have been tested and are currently being used by FNSS, and we are in touch with some other companies.

Another project is Automatic Leveling System, which is produced for military vehicles and has 40 ton capacity. This system provides automatic leveling of military vehicles, which must be leveled and fixed, on inclined surface. This process, which can be done approximately in 50 minutes, has been reduced to 4 minutes by automatic leveling system. This product has passed all the functional tests and ready to use.

Our other completed projects are lifting, transporting and leveling systems developed for the shelters. These systems completely remove the need for a crane to transport a shelter from

one place to another, to load it on a truck, or to unload it from a truck. We have products with carrying and lifting capacities up to 30 tons.

Apart from these projects, we work for the blower fans used in many military systems. In a short time, tests of these fans will be completed. Finally, in the field of aviation, we have reached a final stage in our negotiations with a company, however I am not able to reveal the name at the moment, to develop a very important subsystem. Some of the products we have developed are produced with 3D printers in order to be much lighter and stronger. Thus, we can meet the requirements of the aerospace and defense industry and respond to our customers at lower prices for lower production quantities.

Defence Turkey: What would you like to say about the capabilities making you stand out from other companies operating in your field?

As you all know, we were established as a machining company only, but the place we are now is far away from the beginning because by getting the support of PEM, who has a serious international market experience and working in (national & international) defense market since more than 20 years, we have expanded our vision which helped us to set up our mission for the future.

Our existence presently is to support our customers and counterparts as a complete system supplier for mechanical and electromechanical products, not only a machining company. I believe this is the most important differentiation.

Defence Turkey: Where is GES Engineering positioned for the next decade, especially in the aerospace and defense industry?

We would like to be a trustable partner for all national & international companies in terms of manufacturing capabilities, design capabilities and turnkey system solutions.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We are dedicated to improvement and widening our capabilities in the aerospace field which we believe is a promising area and of course our upmost goal is to be well positioned in the international & domestic market for both Land & Air Platforms.

Defence Turkey: You have also contributed to the defense industry as managing partner of PEM Engineering for long years? Could you please inform us about your activities in that respect?

Of course, PEM Engineering has been a school for all of us. As I have stated earlier; the experience we have gained in PEM helped us a lot to see and evaluate the market from different perspectives. This has always helped us to take the right decisions in the business life. Before concluding I would like to take this occasion to thank to Mr. Ruhi Baytar who has been and is still being a great teacher to all PEM Family.

Defence Turkey: Finally, would you like to add a message for our readers?

Everybody should have their own dreams and goals which they really believe in. If you have your passion, mission and goals you can become a real added value for the people around you and for the business you are in. I have a proverb hanging on my office wall that I never skip a day without reading it:

"Yesterday is History,
Tomorrow is your Future,
Today is your Life..."

So, work hard for a better future to leave for the ones coming after you but don't ever miss today!!!


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Ms. Ayşe Evers - Editor in Chief of Defence Turkey Magazine with Mrs. Arzu Baytar- the Chairman of the Board at GES Engineering

Pakistan Navy Fleet Tanker PNS Moawin is in the Indian Ocean

The Navy Fleet Tanker Project designed and developed by STM for the Naval Forces of Pakistan is at the final stage. The Navy Fleet Tanker which is the Turkish Defense Industry's largest block military export ship project, successfully completed its first sea trial in the Indian Ocean.

The Navy Fleet Tanker 'PNS Moawin', the main contractor of which is STM, was built by the Pakistan Defense Production Ministry at the Karachi Shipyard in order to meet the requirements of the Pakistan Navy.

The Navy Fleet Tanker, which is Turkey's largest block export in the military ship field, has made history as one of the most unique national projects that develops military cooperation between the two allied countries. The success achieved in this project was one of the important factors that led to STM acquiring the Agosta 90B Submarines Modernization Project in Pakistan.

PNS Moawin, which is the first ship of its class successfully built at the Pakistan Karachi Shipyard (KSEW) through the design, production data package and technical support provided by STM, reached the Indian Ocean from the Port of Karachi on March 31, 2018.

The Pakistani shipyard personnel and crew, 30 STM employees and representatives of the Turkish subcontractors of STM attended the first cruise of the Navy Fleet Tanker.

In its cruise which occured during the night, PNS Moawin's critical systems were tested. It performed above expectations and successfully completed the tests and returned to Karachi Port.

Navy Fleet Tanker

The Fleet Tanker, which is the first ship of its class and developed together by STM and Pakistan Naval Forces in accordance with the operational needs of the Pakistan Navy, weighs 16,400 tons and is approximately 158 meters long. It can achieve speeds up to 20 knots with two propellers with adjustable blade angles powered by two diesel engines. Electrical power of the ship is provided by four diesel generators.

With its Replenishment/ Fueling-at-sea systems (RAS/ FAS), the ship will support the Pakistan Navy's combat/auxiliary elements by transferring critical equipment such as fuel/water and ammunition at sea during operations, thus increasing their operational capability.

The ship also has a comprehensive infirmary in addition to its day and night helicopter deployment operations capability thanks to its hangar and platform.

Turkey's World Class Defense & Aerospace Business Forum

Industrial Cooperation Days in Defense & Aerospace (ICDDA)

OSSA aims to assist large firms and SMEs involved in the global aviation, and space industries, having civil and defense applications, to explore specific markets and seize business and partnership opportunities. Our Aerospace Meetings offer business to business platforms, high level conferences and industrial tours to better comprehend aerospace business in targeted countries and areas having specific requirements and opportunities.

Benefits

Ankara Industrial Cooperation Days in Defense and Aerospace is an outstanding and supply chain oriented business forum for contract manufacturers to meet through pre-planned business to business meetings and discuss partnership or business opportunities.
OEMs and their Tier 1 suppliers will meet contract manufacturers offering specialised capabilities and services for civil and defense applications. These diversified programs reveal business and investment opportunities in the country.
Save time and Meet relevant contacts in just 2 days!

One to One business meetings

Our business forums offer aerospace companies the opportunity to identify and request meetings with relevant contacts prior to the forum.
Ankara Industrial Cooperation Days in Defence and Aerospace provides pre-arranged meetings for all the attendees based on their own choices.
This is an outstanding tool for supply chain, procurement, technical teams, suppliers and contract manufacturers to save time, meet the right people and discuss their requirements and capabilities.

Conferences

Ankara Industrial Cooperation Days in Defense and Aerospace offers a must-attend-conferences program. These are excellent opportunities for professionals to share experiences and better comprehend the market's scientific, industrial, technical and commercial evolution.

Organization Profile

On the first day of ICDDA, conferences on the topics of Civil Aviation, Maritime-Air-Land Systems, Homeland Security Technologies, Supply Chain Strategies and sectoral problems faced by the industry are hold in the presence of domestic and foreign competent moderators.

Possible solutions are also discussed with more than 1600 officials from several qualified institutions including military and commercial attaches, distinguished bureaucrats from ministries, representatives from armed forces.

On the 2nd and the 3rd day, bilateral business negotiations are organize for the participants in their booths.

2016 Sponsors

TAI, ASELSAN, HAVELSAN, FNSS, ROKETSAN, TEI, OTOKAR, DASSAULT SYSTEMES, TEKNOPARK ISTANBUL

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Industrial Cooperation Days in Defense & Aerospace (ICDDA)

In 3rd edition ICDDA which took place in October 2016, 5400 registered bilateral business meetings were held among the participation of over 200 companies from 33 countries. In addition to the participation of many important companies such as AIRBUS DEFENSE AND SPACE, BOEING, DASSAULT SYSTEMS, EADS, LEONARDO GROUP, LOCKHEED MARTIN, MBDA, NAVANTIA, ROLLS ROYCE, SIKORSKY, THALES from abroad, also main industry companies from Turkey such as TAI, ASELSAN, HAVELSAN, ROKETSAN, FNNS, TEI, ISTANBUL SHIPYARD, MKEK, OTOKAR have also part place in the event.

List of Represented Countries

AUSTRIA, BELGIUM, BOSNIA HERSAGOVINA, CANADA, CHINA, CZECH REPUBLIC, ENGLAND, FINLAND, FRANCE, GERMANY, INDONESIA, IRELAND, ITALY, JORDAN, LEBANON, MALAYSIA, MEXICO, MOROCCO, NETHERLANDS, NORWAY, POLAND, PORTUGAL, ROMANIA, RUSSIA, SAUDI ARABIA, SLOVENIA, SOUTH KOREA, SPAIN, SWEDEN, SWITZERLAND, TUNISIA, QATAR, UKRAINE, U.S.A.

Some Views of Participants of ICDDA:

Andy Johnson, ROLLS-ROYCE VP South Africa&Turkey: Industrial Cooperation Days in Defense and Aviation ICDDA is a good event that we have been here out to meet both local and international companies. This really helps business growth globally. It is a good event to also discuss our advanced manifacture technology center. This is center we hope to work companies from Turkey and internationally. So we can build skills and capabilities within Turkey to be even greater.

Jill Christenson, BOEING Procurement Manager: It has been a pleasure to be a part of aerospace activity here in Ankara. It is my first time in Turkey and it has been amazing to see all of the capabilities and the suppliers and the technology that is available in Turkey and the growth we can have here together as an aerospace industry between Boeing, Airbus and military.

2013

220 Participant Companies
From 22 Countries
44,8% From Abroad
2000 B2B Meetings

2014

250 Participant Companies
From 34 Countries
45,2% From Abroad
4800 B2B Meetings

2016

200 Participant Companies
From 33 Countries
46% From Abroad
5400 B2B Meetings

For Further Information

www.icdda.com.tr
www.ankara.bciaerospace.com

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Turkey
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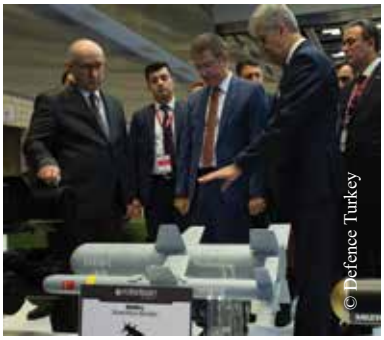
the potential

Exhibitors by Branches

Turkish Companies Received Total $800 Million in Orders at DIMDEX Fair

The sixth International Maritime Defense Exhibition & Conference (DIMDEX 2018) was held on 12-14 March 2018 in Doha/Qatar under the auspices of Sheikh Tamim bin Hamad Al-Thani, Emir of the State of Qatar and hosted by Qatar Armed Forces.

Over sixty countries from Europe, America, the Far East and the Gulf Region participated in the Fair. Turkey participated nationally in the fair with thirty-three companies with the Defense and Aerospace Industry Exporters' Association under the coordination of the Undersecretariat for Defense Industries (SSM). UNIFO, Garanti Giyim, Transvaro, Dearsan, TÜBİTAK-Bilgem, MilSOFT, Meteksan Defense, SDT, MKEK, TAIS, Ares Shipyard, Aselsan, İşbir, Nurol Makina, Sarsılmaz, Roketsan, Gül Otomotiv, Havelsan, Yonca-Onuk, Aksa Run Flat, Turmaks, SİMBT, AVS, Kale Aero, Medyacity, STM, AN Grup, Ankaref, Kale Kalıp, Desan, Akademi Sancak, Ctech, TÜBİTAK-Sage and SBI Bilişim are the companies from Turkey that participated in the Fair.



Turkey participated in the fair with 24 companies in 2016 and attended this year for the fourth time and with thirty three companies resulting from an increase in business connections with Qatar.

High level official delegations including the National Defense Minister Nurettin Canikli, Chief of General Staff General Hulusi Akar, Naval Forces Command Vice Admiral Adnan Özbal and Undersecretary for Defense Industries Prof. İsmail Demir participated in the Fair. The official delegation visited the Turkish stands on the first day of the fair and received information from the company representatives about their activities in the region.

While the solid output of the increasing political and commercial business co-operation with Qatar were achieved at DIMDEX 2018 Fair, Turkish companies received an order of approximately $800 million from Qatar State.

Anadolu Shipyard signed the final contract with the Qatari Emiri Navy for the supply of two training ships after a 3-year ongoing negotiation. Yonca-Onuk signed two separate contracts with Qatar Armed Forces for four Yonca-Onuk MRTP24/U Special Operations Crafts (SOC) and four Yonca-Onuk MRTP24/U Fast Missile Crafts (FAC). BMC signed a contract with the Qatar Armed Forces to procure 50 "Kirpi-2" MRAPs and 35 "Amazon" armored vehicles. Baykar Makina, which realized mini-UAV sales for the first time in Qatar in 2012, exported "Bayraktar TB2" UAV systems that operationally proved itself to Qatar this time. Within the scope of the contract, six "Bayraktar TB2" systems and three ground control stations will be procured to the Qatar Armed Forces by Baykar Makina. On the other hand, Nurol Makina that realized three hundred forty-two "Ejder Yalçın" 4x4 vehicle sales to Qatar in the past, realized the first sale of the NMS 4x4 armored vehicle, the test process of which is still continuing to Qatar. Ares Shipyard signed the 3rd contract with the Qatar Coast Guard Command at the DIMDEX Fair. On the second day of the DIMDEX Fair, the parties signed a new contract to supply three 48-meter Ares 150 Hercules Offshore Patrol Boats and six Ares 80 SAT Boats.

In addition, a contract was signed with Piri Reis University during the fair for the establishment of an academy for the Qatari Emiri Navy and the training of its personnel. Within the scope of the contract, Piri Reis University will provide support and services for the establishment of the academy, efficiency of the academic and administrative personnel systems, creation and follow-up of the curricula.

Aselsan to Establish a Joint Venture Company in Qatar

Aselsan will establish together with Barzan Holding, a subsidiary of the Qatar Defense Ministry, a JV company named BARQ for the production of some defense industry products, which also include technology transfer. In this context, it is anticipated that production activities will be realized mainly for remote controlled stabilized weapon systems and electro-optic systems for reconnaissance and surveillance. The production within the scope of the JV will be developed in line with the future needs of the Qatar Armed Forces.

Nurol Makina and Qatar Special Forces Command Sign a Goodwill Agreement for the Procurement of NMS 4X4

Qatar Special Forces Command will procure 214 New Generation Light Armored NMS 4x4 from Nurol Makina

At the DIMDEX 2018 fair, a goodwill agreement was signed between Nurol Makina and Qatar Special Forces Command for the supply of NMS 4x4 vehicles.

During the ceremony with the participation of Nurol Makina Deputy General Manager Dr. Anıl Karel, Qatar Special Forces Commander General Hamad bin Abdullah Al Fetais Al Marri and numerous military and defense officials, Al Marri made a brief statement about the details of the agreement: "I would like to state that we are very happy to procure 214 NMS 4x4 vehicles from Nurol Makina. This agreement completes the previous 342 'Ejder Yalçın' vehicle procurement agreement and is a second agreement covering the procurement of 214 NMS 4x4 vehicles. With this agreement, we are procuring the world's best vehicles. We hope that this agreement will encourage both our army and this partnership to go further."

During the DIMDEX fair, at the Barzan Holding stand, two NMS 4x4 Armored Vehicle initial prototypes, where Anti-Tank Missile Launcher System and IGLA Missile Launching System were integrated, received full marks from the Qatar Armed Forces officials and visitors. These two-initial prototypes took place in the official parade on the National Day of Qatar for the first time last December.

© Defence Turkey

The Outstanding Capabilities of the New Generation Light Armored NMS 4x4

The New Generation Light Armored NMS 4x4 is designed uniquely by Nurol Makina and it stands out with its V-shaped monocoque body and an unmatched military chassis. The lower weight of the vehicle, its outstanding protection against mines and ballistics offer its users high survivability even against aggressive and asymmetric threats and this makes the vehicle superior during the course of operations.

The armor of the vehicle can be adjusted to different levels varying from 1 to 4 in accordance with customer requirements. The armor level enables adjustments. With its lightweight and superior maneuvering capability as well as the easy configuration change feature, it can swiftly cater to the requirements of the procurement authorities.

The quite low turning radius of the modular NMS 4X4 promises its users great advantages through urbanized terrain operations. NMS 4x4 is designed and equipped with readiness for multi-role capabilities and also features a series of capacities ranging from the transportation of weapon systems in combatant units to reconnaissance and surveillance tasks.


© Defence Turkey

Anadolu Shipyard Awarded Contract by Qatar Armed Forces to Build Two Naval Cadet Training Ship

The Qatari Emiri Naval Forces (QENF) has ordered two Cadet Training Ships with space allocations for theoretical and practical training facilities for cadets and instructors

At the DIMDEX 2018 fair held in Doha, Qatar on 14-18 March 2018, the final contract for the supply of two Cadet Training Ships (CTS) was signed between Anadolu Shipyard Chairman Mr. Süalp Ürkmez and QENF officials.

Making a statement for our magazine after the contract award, Anadolu Shipyard Chairman Süalp Ürkmez stated that the supply of two Cadet Training ships has now become official with the completion of the long- expected approval process and said: "We will supply two armed training ships for the Qatari Emiri Naval Forces. These platforms can also perform as an armed combat training ship as well as patrol tasks. We have been exerting great efforts for about

three years for these ships that have special areas for both cadets and instructors and are designed by our shipyard engineers. A study was conducted for about a year and a half for the technical requirements of the ship. With the completion of this process, in August 2017 Qatar decided to procure the ships. We signed the final contract today after the contract negotiations which lasted seven months. We will deliver the first ship within 30 months and the second one will be delivered within 6 months after the delivery of the first one."

Stating that in addition to the Anadolu Shipyard, TAIS Shipyards

corporation is also following projects in Qatar, Ürkmez said that negotiations with the parties continue and that the expectation is that TAIS will realize their first sales in Qatar this year.

Cadet Training ships will be approximately 90mt in length and will have full load displacement of 1,950 tons. Besides basic naval cadet training, CTS will have a helipad for a medium sized helicopter on the stern and will be capable of providing combat management and weapons training to trainees as well. Secondary missions such as offshore patrol duties can also be carried out.

Anadolu Shipyard - Cadet Training Ship

Qatar to Procure Armed Bayraktar TB2 UAVs

"Bayraktar" TB2 Unmanned Aerial Vehicle System that has been actively used by the Turkish Armed Forces and General Directorate of Security since 2015 and has been serving within the scope of Operation Olive Branch has achieved its first export achievement

At the DIMDEX 2018 Maritime Defense Fair in Doha / Qatar, the signing ceremony was held with the participation of Mr. Serdar Demirel, Deputy Undersecretary of the SSM, Commander of the Qatar Air Forces Exploration and Surveillance Center and Head of the UAV Committee, Brigadier General Mohammed Owaida Al-Ramzani and Baykar Makina General Manager Haluk Bayraktar. With this signing ceremony, the first export of the advanced unmanned aerial platform and auxiliary system in this class and size was achieved in the history of the Republic of Turkey.

© Baykar Makina

Within the scope of the contract signed between Baykar Makina and Qatar Armed Forces, 6 Armed "Bayraktar" TB2 Air Vehicle Platforms and 3 Ground Control Station Systems and equipment and a UAV Training Simulator will be delivered. In addition, the UAV Operation Center and the nationally developed network-based data monitoring and archiving software system will be installed for the Qatar Armed Forces.

UAV Pilot, Payload and Maintenance training will be given to the Qatar Armed Forces personnel in Turkey by Baykar's engineers and training staff. After that, 2 years of logistic and technical support will be provided for the systems delivered to Qatar Armed Forces by Turkish engineers and flight support personnel.

With this contract, many different products and software developed by the Turkish Defense Industry in recent years will be used by the Qatar Armed Forces. These include smart micro munitions, MAM-L and MAM-C products developed by Roketsan nationally, and Geographic Analysis System software developed by PiriReis Information Technologies and used by the Turkish Armed Forces.

It is considered that the cooperation between Qatar and Turkey in the military field will move forward with this development.

New Orders to ARES Shipyard from Qatar Coast Guard Command

Ares Shipyard signed the 3rd contract with Qatari Coast Guard Command during DIMDEX fair

On the second day of the DIMDEX fair, parties signed a new contract for the supply of three 48-meter Ares 150 Hercules Offshore Patrol Boats and six Ares 80 SAT Vessels. Qatari Coast Guard Command officials as well as Ares Shipyard Chairman Kerim Kalafatoğlu, Deputy Undersecretary for Defense Industries Serdar Demirel and Ambassador of Turkey to Qatar Fikret Özer attended the signing ceremony.

Ares Shipyard signed its first contract with the Qatari Coast Guard Command for the procurement of 17 Patrol Boats in 3 different configurations in 2014 and by the end of 2017 a total of 13 Patrol Boats were delivered to the Qatari Coast Guard Command. With the successful project model and management created, Ares shipyard is currently about 20 months ahead of schedule. In January 2018, the parties also signed the second contract, which covers a total of 14 ARES 24 Harpoon Interceptor Boats, with weapons and sensor systems to be integrated into the 17 Patrol Boats Package which is covered in the first contract. With the third contract signed at the DIMDEX fair, the total number of patrol boats and interceptor boats exported by Ares Shipyard to Qatar reached 40. It is planned that the project schedule, which includes the construction and delivery of the nine vessels and boats, will be initiated immediately after the delivery of the seventeenth and final vessel of the first contract.

5th Generation Anti-Drone Weapon from Harp ARGE

Drones have been used widely in recent years due to their easy accessibility and low cost. Drones can perform flights for law enforcement officers as well as commercial, hobby, and even terrorist-oriented purposes. They occupy small spaces due to their structural features and are difficult targets to shoot with pistols and rifles because of their high flight altitudes. The world's leading weapons producers are in search of a solution against drones which recently are rapidly increasing in number, creating many hazards, and those which can turn into deadly threats with malicious uses.


© Harp ARGE

Having a team dedicated to continually developing its product range, Harp ARGE Company, as a result of its research and development activities, produced the first Anti-Drone Electromagnetic Weapon of Turkey. "Drone Savar", which was demanded by the General Directorate of Security (GDS) for the first time for the G20 Summit held in Antalya in November 2015, was later used by the Turkish Armed Forces. The Harp "Drone Savar" Anti-Drone Electromagnetic Weapon, which was developed by Harp ARGE's own resources, successfully passed through the rigorous tests of the Azerbaijani Armed Forces and started to serve in the Azerbaijan Presidency as the first export customer in 2017.

The 4th Generation Harp "Drone Savar" Anti-Drone Electromagnetic Weapon, used with a backpack that contains weapons and electronic equipment, is an effective solution designed to block and capture the drone that can be used for offensive purposes. Using the "Drone Savar" Anti-Drone Weapon for 3 seconds is enough to take over the drone systems. Drones exposed to electromagnetic attack are inactivated by disconnection with the command control. The "Drone Savar" offers an effective solution to fight against drones, because there is no harm to human health and environmental safety, and it produces noiseless and fast results.

The attacks carried out by terrorist organizations (ISIS, PKK / YPG) during Operation Euphrates Shield and Operation Olive Branch executed in Syria by using bomb-laden drones against Turkish security forces, attacks on our borders by using bomb-laden drones and patrol surveillance activities have revealed how critical technology the Harp "Drone Savar" is. The 4th Generation Harp "Drone Savar" Anti-Drone Weapon, which is actively used against terrorist organizations at the border, proved to be effective on all known drones.

Harp ARGE, which has many references such as the Azerbaijan Presidency, Turkish Land Forces Command, Security General Directorate, Anti-Terror Division of the Security General Directorate and the Uludere District Governor, has continuously developed Turkey's first drone killer electromagnetic weapon namely the 4th Generation Harp Drone Killer by taking into consideration customer demands, feedbacks from end-users, technological progress and the capabilities of the drone weapon.

The electronic backpack in traditional systems was reducing the operational capability of security forces in challenging field operations, whereas the 5th Generation Harp "Drone Savar" provides operational superiority with its low weight, compact structure and carbon fiber main body.

The "Drone Savar" Anti-Drone Electromagnetic Weapon is a product available for sales only to security forces/law enforcement agencies.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When the Going Gets Tough, the Tough Get Going – Environics Provides Solutions for Naval CBRN Monitoring and Armored CBRN Reconnaissance

by Mrs. Katja Kiukas- Product Manager for Bio Detection and CBRN Systems and as an Application Specialist for Building CBRN Monitoring in Environics Oy

Life in the Middle of Evolving Threat Environments

Countries worldwide are currently facing challenging threat environments, in which terrorist groups are in constant search for new methods to cause panic, disruption and loss of lives and money. The use of chemical, biological, radiological and nuclear (CBRN) threat agents is typically low in frequency and probability, but it may be high in consequences, when the threat agents end up in the hands of well-trained and determined lone wolves, sympathizers or active members of terrorist groups. Furthermore, the recent war scenes have shown lately, that it is not only CBRN terrorism we are dealing with – not to forget the possibility for accidental CBRN releases either.

In peacetime and wartime missions, military forces may encounter employment of both traditional, unconventional and hybrid strategies to threaten the security of nations and societies. No matter if the threats emanate from other nations, non-state actors or accidents, military forces need improved protection and preparedness to detect and tackle CBRN threats at the early stage in a wide variety of physical environments such as in rural, littoral, mountainous, urbanized or industrial areas.

CBRN Monitoring in the context of Naval Vessels and Armored Vehicles

Naval vessels and their crew are vulnerable to CBRN threats in their offshore, littoral and harbor related activities. The threats may take many forms: contaminated food, drink or other harmful supplies onboard, airborne biological line releases in the littoral waters or in a naval port

facility or chemical releases in the beachfronts, for instance. They may incapacitate the whole fleet in the worst scenarios. On the other hand, CBRN Reconnaissance Vehicles operate often as tactical, on-site level land-based command centers and facilitate themselves versatile CBRN reconnaissance and survey tasks. The CBRN Reconnaissance Vehicles are capable of monitoring large areas such as industrial sites, airports, harbors, routes and zones, where on-foot recce teams cannot be employed. The typical tasks include reconnaissance missions to detect possible CBRN attacks or accidents and survey tasks to define the characteristics of a destination or the boundaries of the confirmed CBRN contamination or a decontaminated area. In addition, the vehicles enable collection of CBRN samples to be analyzed on site or in a laboratory. The capabilities of the vehicles may vary from simple CBRN detection, sample collection and area marking to more advanced CBRN identification.

Understanding of CBRN threats, evaluating the vulnerabilities and considering the operational and instrumental needs for committing the intended missions is a good start on the road of getting prepared, but real assessment of the security measures and their effectiveness and implementation of reliable CBRN monitoring systems are the following essential steps. The needs for maintaining the selected CBRN instrumentation and competence of personnel by regular system and tactical trainings cannot be ignored either.

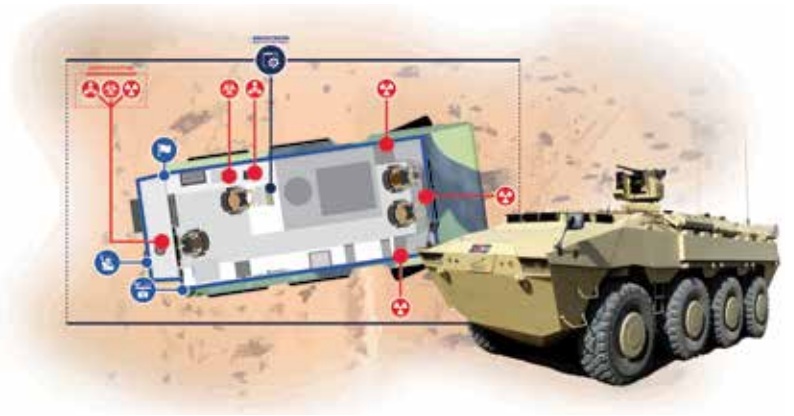
Partner in CBRN System Design and Supply

Environics, a Finnish high technology company, has gained over 30 years of experience in the field of CBRN detection. In the course of time, the company has improved CBRN safety worldwide with its in-house technologies and system solutions. Different organizations from civil defense to homeland security and to the military in 50 countries have already selected Environics as their partner in CBRN threat detection. Nowadays Environics seeks for solid growth in CBRN System Business by focusing on application-based concept and product development and after sales services. Many of the success stories relate to naval CBRN monitoring and CBRN reconnaissance: among other CBRN monitoring applications, Environics designs and supplies

EnviScreen CBRN Monitoring Systems to environmental survey vessels and military vessels from frigates to mine hunters and from light to armored CBRN reconnaissance vehicles. To date, over 100 naval CBRN systems installations have been implemented in co-operation with leading shipbuilding companies. In addition, Environics has installed successfully tens of CBRN monitoring systems for wheeled armored CBRN and light CBRN reconnaissance vehicles. Environics´ CBRN reconnaissance vehicle concept is chassis independent: the company provides its customers in the civil and military defense with scalable CBRN solutions on diverse vehicle chassis models according to customers´ requirements, acting either as an integrator or as a CBRN detector supplier or in combination of those.

CBRN monitoring/detection, provisional identification, meteorological measurements, data processing, collective protection and decontamination are typical valued elements in naval vessels and CBRN reconnaissance vehicles. The modular structure of Environics´ EnviScreen CBRN Monitoring Systems enables delivery of cost-effective and easily expandable solutions according to customers' existing and future needs. Environics builds its CBRN Monitoring concepts upon the general detection principles and recommendations for application related special equipment and systems. It aims 1) to protect the personnel from CBRN threats and their hazardous effects by giving fast response and early-warning 2) to provide situational awareness and guidance and 3) to enable further analysis and timely and correct countermeasures at the time of threats. Typical EnviScreen CBRN Monitoring Systems represent turnkey solutions that incorporate sensor integrations, data communication, databases, system services and user interfaces.

In Environics concepts, CBRN releases are typically monitored from outdoor air and/or indoor air with respective field proven detectors – and some chemicals even from heated ground samples. Measurement and event data from the integrated sensors is collected and harmonized by data processing units and eventually visualized in real-time on the control center computers by the dedicated system



software. The software provides a graphical user interface for sensor management and for displaying event and measurement data and end user specified, event related guidance for the operators. In addition to the fixed installations, Environics supplies CBRN capabilities in the form of hand-held and portable instrumentation for CBRN detection and identification needs, as well as other system supporting components, personal protective equipment and devices and tools for decontamination.

Application Oriented Product Portfolio

Demand for high quality, durability, tolerance and reliability in military operating environment has been taken into account by Environics in both its own application-based product development and selection of complementing products to guarantee uncompromised CBRN detection performance and completion of the intended missions. As a part of this approach, Environics has developed rugged, tested military grade device versions applying the core technologies – a Rugged ENVI BioScout for detection of potentially harmful bioaerosols, ChemProDM for chemical (CWAs/TICs) detection and a Rugged Master Module for data processing to be implemented in Naval CBRN Monitoring and Armored CBRN Reconnaissance.

Environics has also emphasized the importance of collecting representative air samples to the chemical and biological detectors by designing dedicated and robust air sampling systems for

different system applications. They are intended to prevent effectively interfering dust entry and humidity condensation in the systems and to provide mechanical support and protection to the sampling lines.

On top of the selected 3rd party solutions, Environics´ own product portfolio offers several complementing products to fixed installed CBRN monitoring systems: ChemPro100i Chemical Detectors with optional accessories of the CBRN kit, ENVI Assay System Gold rapid tests for provisional BWA identification and RanidPro200 backpacks and RanidPort portal solutions for radiation detection and identification. Maritime CBRN Monitoring relates also to other areas of applications provided by Environics. One of the latest military grade launches in Tactical Area CBRN monitoring – the EnVision GOSSAMER – can be adapted for temporary surveillance needs in the maritime context, e.g. in sea port facilities. Furthermore, the Border CBRN Monitoring Concept includes in-house solutions for screening of passengers, freight and trucks in sea ports.

They are not only the physical system components that have been addressed in the R&D work in Environics: the system software, EnviScreen Operix, has been intensively developed and modernized to provide several new features for improving user experience by system operators. As a standard, EnviScreen Real-time Operation Tool acts as a graphical user interface for real-time situational overview and sensor management, while EnviScreen System Server provides CBRN event and measurement database and system services. However, optional software modules are available for expanding the capabilities beyond that. The versatile EnviScreen Operix provides real-time situational awareness simultaneously from multiple locations, CBRN reporting and hazard area plotting,

integration of the CBRN Monitoring data to 3rd party systems like Ship Control and Automation Systems or Battle Management Systems, e.g. for shutting down ventilation and initiating CBRN filtration or comparable actions. As a practical solution for creating realistic training exercises, the EnviScreen Operix Simulation Tool meets the essential needs for regular trainings to improve and maintains operators´ skills and preparedness for CBRN incidents.

Support for the Whole System Lifespan

EnviScreen CBRN monitoring systems are featured with low costs of ownership, but supplying of first class systems is useless, if they are not maintained operational and if there is no timely technical support and comprehensive user, maintenance and tactical training available in basic and advanced levels through the whole system life-cycle. Environics invests in the full life-cycle support to its customers of CBRN monitoring solutions and commits to optimizing the performance of the systems in order to meet the requirements of variable operating environments. According to its policy, Environics is present from the very first steps of identifying the customer needs and all the way through the design and delivery to the training, customer support and after sales services. Working in close co-operation with the customers is beneficial for both parties. Valuable customer feedback is given in the constant dialogue and technical and training support is readily available even in the situations, in which the operators of the system change due to frequent turnover of the crew. It is also a real advantage that the customers can rely on Environics as an experienced, single turnkey provider for the CBRN Monitoring systems.

Biography of the writer:

Mrs. Katja Kiukas, MSc, BBA, has gained over 10 years of application, business and technology-oriented expertise in the field of Bio Detection and CBRN Monitoring Systems for naval vessels, land vehicles, area monitoring and critical infrastructure protection. She works currently as a Product Manager for Bio Detection and CBRN Systems and as an Application Specialist for Building CBRN Monitoring in Environics Oy.

Aselsan's "MUHAFIZ" Remote Controlled Weapon System Export to South Asia

Aselsan, one of the leading companies of the Turkish defense industry, signed a contract with an institution of a South Asian country providing services for national defense technologies for the supply of the MUHAFIZ (SMASH) Remote Controlled Stabilized Naval Gun System. Through this contract, Aselsan added one more country to the list of countries to which it exports the MUHAFIZ weapon systems

Aselsan added another country to its list of countries to which it exports products for national defense industry technologies. With the contract on the procurement of MUHAFIZ weapon system signed with a South Asian country's institution providing services in national defense technologies, Asian countries increasingly continue to utilize Aselsan's Remote Controlled Weapon Systems.

"MUHAFIZ" the 30mm Remote Controlled Stabilized Weapon System

One of the world's leading defense industry companies Aselsan's Remote Controlled Weapon System MUHAFIZ features the automatic target tracking capability and remote-control capacity and high stabilization performance equipped with a 30mm weapon. MUHAFIZ is a versatile and effective system that could be integrated to coast guard and patrol boats, landing crafts and other naval platforms. It provides efficient protection against the asymmetric threats with its high precision shooting capability.

SaSaD's 29th Ordinary Meeting of the General Assembly and Sectoral Meeting Held in Ankara

SaSaD's 29th Ordinary Meeting of the General Assembly was held on April 24, 2018, at the Hilton Garden Inn Hotel / Ankara, together with the Sectoral Meeting.

The full-day event took place with the participation of Deputy Undersecretaries for Defense Industries Celal Sami Tüfekçi and Mustafa Murat Şeker as well as the Undersecretariat personnel. TÜBİTAK Vice President Orkun Hasekioğlu, OSTİM Chairman Orhan Aydın and nearly 200 member company representatives also attended the meeting.

SaSaD Chairman of the Board Temel Kotil, Ph.D started his speech by expressing his honor and pride for the superior performance of the systems taking part in the TAF inventory during Operation Olive Branch and stated that the industry is exerting great efforts to meet the needs of the Turkish Armed Forces at a higher level and without interruption. He also stated that the sector players came together at this meeting regarding the subsystems and components that are subject to import today but are planned to be nationalized.

The representatives of 11 SaSaD member companies (Aselsan, FNSS, Havelsan, Istanbul Shipyard, MKEK, Nurol Makina, Otokar, Roketsan, TAI, TEI, Yonca-Onuk), which are platform and system producers as well as main contractors, were present at the sectoral meeting held before the Ordinary Meeting of the General Assembly and made presentations on subsystems and components they planned to share with subcontractors in the short and medium term. Also, the Ministry of National Defense and Undersecretariat for Defense Industries shared sectoral reports with the participants. In addition, during the sectoral meeting, bilateral business meetings were held between the members making presentations and with other participants.

© SaSaD

Following the Sectoral Meeting Activity, the 29th Ordinary Meeting of the General Assembly started and in his opening remark of the meeting, Kotil Ph.D said: "Based on global and regional crisis situations and economic planning, countries are preparing their budgets for defense expenditures. Global defense expenditure in the year 2017 was around $1 trillion 709 billion, showing the first upward trend in the last three years. Turkey is ranked as the 15th country amongst the countries spending most on the defense industry. Amongst the top 100 largest defense industrialists, Aselsan ranks 57th, TAI 61st and Roketsan 98th.

Following the opening speech, within the framework of elective Ordinary General Assembly election agenda, the study report and the audit report were read and the Board of Directors and the Supervisory Board were discharged.

SaSaD Secretary General Hüseyin Baysak provided information on the new period work plan and budget, and then the new term work plan and budget were approved. After these activities on the agenda, elections were made. With the votes of the member representatives of the Association, the Official Members who will take part in the SaSaD Board of Directors for a period of two years were selected.

Permanent and Substitute Members of the Board of Directors, Supervisory Board Permanent and Substitute Members, Disciplinary Board Permanent and Substitute Members, who have been elected by the Association members for a period of two years, are provided below:

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Board of Directors Permanent Members

- Roketsan- Selçuk Yaşar (Representative)
- Aselsan - Prof. Haluk Görgün
- FNSS - Nail Kurt (Representative)
- Alp Havacılık - Yılmaz Güldoğan (Representative)
- Havelsan- A.Hamdi Atalay (Representative)
- Otokar - Serdar Görgüç (Representative)
- MKEK - Ahmet Taşkın (Representative)
- TAI - Prof. Oğuz Borat (Representative)
- Nurol Makina - Engin Aykol (Representative)
- AYESAŞ - Öner Tekin (Representative)
- OSSA - Mithat Ertuğ (Representative)
- SAHA İstanbul - İlhami Keleş (Representative)
- Bites - Uğur Çoşkun

Board of Directors Substitute Members

- TEI - Prof.Dr. M.Faruk Akşit (Representative)
- TSSK - Mustafa Kızıltaş (Representative)
- Savronik- Kenan Işık
- İleri Grup - Halit İleri (Representative)
- Kale Havacılık - Yalçın Yılmazkaya (Representative)

Supervisory Board Permanent Members

- Mege Teknik - Ali Han (Representative)
- Simsoft - Gökçe Yıldırım Kalkan (Representative)
- BMC - Taha Yasin Öztürk (Representative)

Supervisory Board Substitute Members

- Roketsan - Atakan Ata
- Havelsan - Mustafa Egeli
- TAI - Saadet Korkem

Disciplinary Board Permanent Members

- MKEK - Sait Demirci
- Aselsan - Hezarfen Oruç
- Meteksan Defense - Tunç Batum (Representative)

Disciplinary Board Substitute Members

- Roketsan - Hayri Torun
- C2Tech - Cüneyd Fırat (Representative)
- Timsan - Haldun Aksoy (Representative)

Following the general assembly, MKEK Representative Ahmet Taşkın was selected as the Chairman of Board, AYESAŞ / Vestel Defence Representative Öner Tekin as Vice Chairman of the Board and Uğur Coşkun from Bites Company as Treasurer during SaSaD's new Board of Directors meeting held on May 11, 2018.

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Leonardo Maximizing the Operability of State of the Art Technologies

Leonardo, a global high-tech company and one of the key players in Aerospace, Defence and Security held a two-day press tour to showcase "The technological evolution of Leonardo's naval systems for maritime surveillance and security

Members of the media were invited to Leonardo's Press tour on the 27-28th of February, Rome, Fusaro & Arco Felice (Naples). Briefings and site visits provided an upclose and detailed account of Leonardo's impressive current and future naval capabilities.

On the first day of the tour a presentation was given by Mr. Angelo Pansini, Senior VP, Strategy & Product Planning at Leonardo's Land and Naval Defence Electronics division on "Leonardo's capabilities in the naval sector" which was followed by a visit to main site facilities: the foundry, the naval integration area, the anechoic chamber and the Logistics Operations Center as well as Captain (N) Francesco Gennaro Esposito, MARISTAT, Marina Militare Italiana gave presentation about the "Italian Navy in modern Scenario: Combat System Evolution" A comprehensive presentation given by Mr. Pansini provided details demonstrating the complexity and wide spread divisions of Leonardo. "If we agree that the core business can be defined as a business with huge volumes, significant investment, an international foot print, state of the art products, all of the tiers of the value chain, these are all characteristics that can be applied 100% to Leonardo."

The second day began with a presentation by Giovanni Cristiano and Michele D'Ursorespectively Production and supply chain director and head of manufacturing and supply chain at Leonardo's Land and Naval Defence Electronics division. The presentatons, heldat Leonardo's Fusaro & Arco Felice sites, were followed by a visit to the production, area for the New X-band AESA radar and the IFF (Identification Friend or Foe) secondary radar. Attendees also visited the New combat management system console manufacturing area, the anechoic chamber with the New

fire control system. At Leonardo's Arco Felice site guests were given an opportunity to observe the "ship bridge" technology demonstrator (radar and naval "Cockpit" allowing for the integrated management of sailing and combat system operations).

Naval Systems Evolution

Emphasizing the great relevance of naval domain for Leonardo, Mr. Pansini discussed the company's trifold route in offering products, subsystems and systems. "We are able to provide stand alone products, and in some cases state of the art and best in class, and we provide subsystems that are in some cases very complex systems such as integrated communication subsystems for vessels, infrared fire control systems which are subsystems, and integrated systems. The architecture for a combat system for vessels is very complex and we are able to realize design and integration activities for the vessel."

Discussing maritime capabilities, Mr. Pansini stated that "In some cases we interact directly with the end user in the Navy. There are situations where we interact with the system integrator and platform maker – the shipyard. We interact with the end user to provide the combat system which has such a complex architecture, which impacts the performance of the vessel and it is important for the customer to be able to come directly to us in order to understand the key capabilities and characteristics of the combat system. With the Tier 1 business approach for example, customers come directly to us."

A Key Player in Global Naval Communication Systems

Leonardo provides integrated communication systems for the modernization of defense systems. Mr. Pansini highlighted an example of their modernization activities through a recent contract with the Australian Navy, saying "DRS is engaged in the naval business. For example, DRS is one of the main providers in the US of power generation systems and is on board some key vessels in the US, submarines and aircraft carriers. Together with DRS we won a contract a couple of years ago with Australia for the modernization of their frigates."

Aircraft and Helicopter Divisions Engaged in Naval

"The aircraft, fixed wing, rotary wing divisions again are engaged in the naval arena. The aircraft division is engaged through the special division ATR 42MP aircraft for maritime patrolling missions." Mr. Pansini said.

The helicopter division has an entire section of state of the art helicopters that are all belonging to navies, providing naval and land versions, a key example of this being the multirole AW101 helicopter. Very interestingly Leonardo is also engaged in realizing remote piloted helicopters in two versions, the light version the AWHero and the heavier which is the Solo. For the AWHero, we won the first action call when the EDA (European Defense Agency) issued a couple of very important bids and we won the most important one in the domain of maritime surveillance, named after OCEAN 2020. We are partnering with 42 partners belonging to 15 countries in Europe and one of the key aspects of this was the integration of a remotely piloted rotary wing platform within the CMS of the vessel. This was one of the key elements that allowed us to win this very tough international competition, particularly against the French competitors.

Discussing the activities for the vessels provided globally, Mr. Pansini noted that "There is a valuable difference between the Platform and the entire Warship which is the Combat System (CS). Leonardo normally provides the full CS which is in average 20% of the cost of the vessel, but for some key vessels like the frigates, where the CS is really complex, we are close to and over 40%."

Leonardo's Competitive Edge

Mr. Pansini pointed out that Leonardo is different from their major competitors in its ability to offer system integration capability and the capability to design the architecture of the combat system and at the same time to provide key elements of the combat system such as radars, electronics, torpedos, guns, helicopters. "It's a rare combination to be able to provide this, very competitive."

Mr. Pansini discussed the KRONOS AESA (Active Electronically Scanned Antenna) Fixed Faces Multifunctional Radar sharing that "differently than from the past where an area was scanned mechanically, now the modern antennas are fixed and made by small radars – transmitter and receiver modules. An AESA is characterized by thousands of these modules which provide a lot of advantages for customers. One key advantage is that the antenna is able to be multifunctional. A certain portion of the modules could be dedicated to a surveillance functionality and the other portion of the modules could be dedicated to targeting for example."

ATR 42MP Aircrafts

Multi-Functional Radars

Noting that the success of the vessel is based on 3 elements, Mr. Pansini said "the first element is the radar suite, it is so powerful in terms of multi-functionality that a performing radar makes the difference between a powerful vessel and a non-powerful vessel. The second element is the combat management system which performs the command and control functionality. The third key element is the missile system. MBDA is one of the world leaders, particularly in the naval domain where they provide missile systems for naval air defenseAnother key advantage mentioned is the reliability of the radars. "The antenna could continue to work even if a certain portion of the modules are damaged, and this was impossible in the past. Once the single Transmitter/Receiver or the mechanical scan unit was not working then the entire radar was out."

Mr. Pansini discussed the KRONOS family of radars "we classify them as dual band radar, early warning long-range C band radar, mid-range X band radar. They have a high degree of commonality. The same radar could be also realized in the land version. The TRM models for land and naval versions are exactly the same. We have advantages in phase of design and of production which makes our radars very competitive because we are in a condition to exploit and transfer our technical synergies within our products."

Leonardo's KRONOS Grand Naval Radar Demonstrated Outstanding Anti-Tactical Ballistic Missile capabilities at the Formidable Shield 2017 Exercise

During the US-led multinational exercise Formidable Shield 2017, the KRONOS Grand Naval radar, installed on board of Italy's "Luigi Rizzo" FREMM Frigate, demonstrated the ability to detect, classify and track with outstanding accuracy the tactical ballistic missiles (TBMs) launched during the live exercise according to the official statement of Leonardo press office on 28th February, 2018.

The exercise took place at the UK Ministry of Defence Hebrides Range and involved navies from Italy, Canada, France, Germany, the Netherlands, Spain, the USA and the United Kingdom. The demonstration highlighted the ability of ships from different nations to cooperate in order to defend against airborne threats, both those flying high hundreds of

kilometers (ballistic missiles) and those flying just a few dozen meters above sea level (such as anti-ship missiles), at the same time.

During the exercise, the KRONOS Grand Naval demonstrated that its multi-functional capabilities allow it to perform several types of operational missions. These include air surveillance and missile defence against traditional aerial threats, maneuvering at a variety of altitudes, and defence against tactical ballistic missiles, whose speed and trajectories are extremely challenging even for modern defensive systems. Additionally, Leonardo's ATHENA Combat Management System demonstrated its own ability to make use of the KRONOS Grand multi-mission radar effectively in an Integrated Air and Missile Defense (IAMD) environment. ATHENA shared all tracks, including for ballistic missiles, via data link, making the information provided by the KRONOS Grand Naval available in real time to allied ships and improving the ability of the multi-national task force to effectively cooperate.

The KRONOS Grand is the most technologically advanced multi-functional radar belonging to the AESA (Active Electronic Scanning Antenna) KRONOS radar family, which can cover a wide range of applications. It is based on a fully solid-state AESA design and is entirely produced by Leonardo in naval and land variants. To date, around 30 KRONOS radar systems have been delivered to domestic Italian customers as well as those in the Middle East, Asia Pacific and South America.

KRONOS Grand can be integrated into a defence surveillance network, contributing to overall complete Recognised Air Picture (RAP). When integrated into a surface-to-air missile system, the radar can provide multiple missile uplinks simultaneously.

Leonardo's Combat Management Systems (CMS) equip the units of the Italian Navy and several international naval forces including in the latest those in UAE, Bahrain and Algeria.

Giving special recognition to the Italian navy, Mr. Pansini stated "I would like to emphasize the synergies coming from the Italian navy support for the international successes that we have realized over the last 3-4 years.

Leonardo's Athena Combat Management System

Without the support of the Italian navy both in terms of capabilities, in terms of operational requirements, in terms of support in defining the specs for key elements of the combat systems, the radars, we would never have won internationally."

"For more than 30 years, with the support of the Italian navy, we realized state of the art vessels. There are countries that can be defined as domestic customers for us. We provided combat systems for 4-5 vessel types – these are classes of vessels where we installed the combat systems realized by Leonardo.

Qatar is becoming a domestic customer for Leonardo. We won a very huge contract for our combat system for 3 vessel types. Algeria is another key country for us. We sold mine hunting vessels with a combat system that is specialized for this type of mission and we also provided the combat system for LHD, Landing Helicopter Dock, a multipurpose amphibious assault vessel.

Multi-Mission Vessel Trend Anticipated

"We are renewing the naval radar offering of Leonardo. We are developing new state of the art sensors. We are also developing a specific CMS. The PPA, the multipurpose offshore patrol vessel, requires a multipurpose CMS and a multipurpose combat system. I would like to emphasize an aspect that through the Italian navy and our strategy we have anticipated a clear naval operational trend. Now all the major players are developing multipurpose vessels, for many reasons, because the threat scenarios are so volatile and varied, it's much better to not have a specialized vessel but a vessel that is adaptable to the scenarios and threats. From anti-piracy, missions related to immigration flow controls to other missions that are traditional. We anticipated these characteristics and our products have a competitive advantage in terms of time. I'm not saying that our competitors won't be


Radar KRONOS Dual Band

able to do the same, they will do the same but with a delay, and that will be to our competitive advantage."

Mr. Pansini discussed the 3 typesof PPA offshore Multipurpose Patrol Vessel saying "We have 3 different versions, according to the different level of equipment and radars. We have a light version, light plus and a full version., The PPA are 7 + 3 options. The LSS logistics support ship is a single unit. For the LHD – the key difference is the radar – the L band early-warning radar. The PPA full are equipped with the dual band radar, C band + X band radar, which are managed together through a very complex system manager designed in order to maximize the functionalities of these two radars, which in the end is a single radar.. These two radars are designed to provide the vessel with surface and air search and tracking capabilities. In particular the C-band radar is mainly devoted to cope with air and missile threats and the X-band radar is mainly devoted to performing surface surveillance and tracking. The L-band radar is mounted on the LHD vessel for early warning surveillance. The main difference between these radars is the range. The early warning is designed to cover a longer range. The C and X band cover a range that is much lower. The System manager is responsible for coordination of the sensors, assigning specific functionalities of each radar against the wide spectrum of potential threats."

As Mr. Pansini discussed the L- band, a full digital radar, he reminded his audience that they would see its parts during the visit to the foundry. "Our foundry is a place where advanced micro electronics components, the key building blocks of the AESA radar, are designed and produced. We have two production lines, our location in Rome is focused on engineering and designing. Here we design the TR (TransmitterReceiver) modules. There are radars that have 2000 or more TR modules, so we have the need to produce wide quantities of TR modules and for this reason we duplicated the production area of these modules."

Leonardo is one of the key players in fire control and weapon control systems, selling their products around the world, and is among the

key players in providing IFF radars (Identity Friend or Foe).

Touching on the topic of the Naval Version of Software Defined Radio, Mr. Pansini shared "We are finalizing the development of a complete family of software defined radio. There will be a naval SDR – BLOS (beyond the line of sight), short range network communication. It is actually a computer with an antenna. One single piece of equipment that will realize communication.

New Scenario New Challenges

Captain Francesco Gennaro Esposito, Italian Navy General Staff discussed significance of ensuring that seas are secure. The overarching theme of Mr. Esposito's presentation was the idea that a lack of security on the sea comes at a cost and maritime situational awareness is mandatory.

Highlighting that the center of gravity is drifting towards the sea, Mr. Esposito provided eye-opening statistics regarding the significance of maritime activity worldwide: 90% of the total trade is maritime. 80% of world population lives within 200 nm from the coastline. 75% of traffic passes through few, vulnerable channels and international straits. Italy's role in the Mediterranean: – 8000KM of coastline – 3rd European fishery fleet – 12,700 fishing vessels – 60,000 employees. 19% of the worldwide shipping passes through 1% of world seas. 30% of worldwide crude oil passes through 1% of world seas and 65% of EU energetic resources passes through 1% of world seas.

Mr. Esposito discussed the importance of presence and surveillance in that it grants sea lane freedom of communication and port Access, anti-pollution contrast, archeological site protection, strategic site protection, fishery control, migrant flow control, deter and contrast piracy and avoids illicit trafficing.

New Vessel Programs

Mr. Esposito provided an overview of Italy's role in programs for new ships and combat system evolution. Naval Program(s) 2014 provides the building of offshore multipurpose patrol vessels (PPA), an amphibious unit (LHD) and a logistic unit (LSS). Some of the key features noted is that they are fully interoperable with NATO and EU partners, flexibility and modularity and multipurpose (traditional military tasks – Disaster Relief Assistance Operations). With the multi-functional radar, multi Functionality (Smart System) multiple tasks can be completed (Detection, Tracking, Firing Control System). The radars are capable of operation & integration with other sensors/systems.

The distributed Static Surveillance – InfraRed Search and Track (DSS-IRST) Electro-Optical and Infra-Red Search & Track System (4 fixed sensor + 3 moving search heads) provides a panoramic view (360°) and sectorial view in optical (TV) and Infra-Red bands. It is capable of multiple target tracks with autonomous range measurement (passive or by Laser Range Finder). Passive Surveillance features passive detection/ identification, passive tracking and passive/active ranging. The target designation capability is effective against target not radar detectable.

The 76/62 "STRALES Upper Deck Gun" Gunnery system has a reduced weight with a plug and play installation. With its multifeeding functionality and STRALES ammunition guidance system it is capable of manual and automatic reloading with precision and a high engagement range.

Combat system evolution and innovative capabilities include modular design for mission package concept, light weight design and new active-passive sensors for high level of performance. The TDS – Torpedo Detection Sonar «Black Snake» and ATAS – Active Towed Array Sonar were noted. The active-passive suite is designed for multi-static growth potential technology. It features a high-performance detection range for escorting missions. The Torpedo Defence System has an innovative passive sensor and combined jammer for target emulator countermeasures.

In closing Mr. Esposito noted that in the modern scenario it is mandatory to ensure presence and surveillance, and a combat system must be able to perform and be flexible. "The Italian navy strategy is to be present and active in terms of surveillance. The main challenge is to minimize risks (as they are "first time on the field") and maximize the operability of these brand-new technologies, in order to develop a framework capable to be up-to-date for the next decades."

Leonardo's Latest-Generation Systems for the Italian Navy

Leonardo provides latest-generation naval systems to the Italian Navy (Marina Militare) for its new multi-purpose off-shore patrol vessels (PPA), its new Logistics Support Ship (LSS) and its Landing Helicopter Dock (LHD).

Notably, Leonardo is responsible for providing the ships with their entire combat systems. These integrate all subsystems including electronics and weapons from MBDA.

PPA – Multi-Purpose Off-Shore Patrol

The multi-purpose off-shore patrol vessel is a highly-flexible ship that can perform a range of tasks including patrol, search and rescue and civil protection operations. In its most extensively equipped form, the PPA can act as a frontline battleship.

Operations conducted by PPA ships will include the monitoring of maritime zones, preserving international water rights, counter-terrorism, detecting and interdicting smuggling, helping to control illegal immigration and supporting the Navy's amphibious operations forces. The vessels will also provide humanitarian assistance, shipwreck recovery and support in the event of disasters.

PPA - Multi-Purpose Off-Shore Patrol Vessel

With a modular design, PPA vessels can be equipped in various configurations according to the specific mission it will perform. Contractually, three levels of vessel will be provided, a "light" configuration for patrol missions which also includes integrated self-defence capabilities, a "light- plus" variant and a "full" configuration equipped with the ultimate in defence capabilities. PPA units can also deploy RHIB (Rigid Hull Inflatable Boats) up to 11m long via a side-crane or a stern-located ramp.

For PPA, Leonardo provides a new-generation Combat Management System (CMS). Featuring open architecture, the system is modular and reconfigurable, meaning that the same system can be used for different PPA variants and can integrate extra equipment in future should the Navy require it. The instrument panel also includes an innovative new system called "Cockpit" which Leonardo provides in conjunction with Fincantieri. The Cockpit system allows for the integrated management of both ship operations and the vessel's combat capabilities with the aid of augmented reality, reducing the number of operators required.

In the PPA's "full" configuration, Leonardo will provide a multi-sensor fire control radar (X and Ka band), a new multifunctional Active Electronically Scanned Array radar with four dual-band fixed-face arrays (operating in C and X-bands), Identification Friend or Foe (IFF) sensors and the innovative new 'static InfraRed Search and Track (IRST)' (an infrared sensor that detects and tracks targets using non-rotating optical heads placed around the edges of the vessel to ensure continuous 360 degree coverage). The PPA will also be equipped with Leonardo's integrated communications system that incorporates multi-band satellite systems and the company's new Software Defined Radio (SDR).

For all PPAs, Leonardo will provide its 127/64 LW naval gun, the world's most advanced large-calibre naval gun. The system comprises a turret, an automatic ammunition feeding system (AAHS), a planning system for fire-support missions (NFCS) and the new Vulcano ammunition. The latter features a fin-stabilised airframe with canard-control and is available in two main variants: a guided (GLR) long-range (100km) version for anti-ship combat or the precision targeting of ground targets and an unguided round (BER) with a programmable fuse for multiple roles, which has a range of 60km.

Leonardo will also fit the PPA vessels with small and medium-calibre weapons. In the medium-calibre field, Leonardo will provide the new 76/62 Compact naval gun. A multi-functional weapon, it can be used against air, land, seas and asymmetrical targets. The Compact version, as the name suggests, minimises space requirements by

not extending beyond the hull of the ship. It will be equipped with the Strales system, enabling the gun to use DART (Driven Ammunition Reduced Time-of-flight) guided ammunition.

Small-calibre 25mm naval turrets will also be provided for close protection or for the interdiction of maritime traffic and in the fight against smuggling operations.

The PPA in its "full" configuration will be equipped with Leonardo's ODLS 20 decoy launching system. This allows for the accurate deployment of decoys, providing passive defence against radar and IR homing missiles as well as assisting with Anti-Submarine Warfare (ASW). Leonardo will also provide the ship's Patrol torpedo launch system, the Underwater Telephone, the BathyTermograph unit and a Diver Detection Sonar.

Finally, MBDA will provide air-defence systems and/or anti-ship systems, depending on the configuration of the PPA. A vessel in a "light" configuration will be 'fitted-for' the future installation of missile systems, air defences and anti-ship systems.

LSS – Logistic Support Ship

The Logistic Support Ship supports the logistic requirements of the fleet. It is able to transport and distribute both liquid supplies (fuel/fresh water) and solid supplies (parts, food & ammunition) and perform the maintenance and repair of fleet vessels at-sea. The LSS also provides health services to naval forces at sea via a fully-equipped hospital with operating theatres, radiology and analysis facilities, a dental surgery and an emergency centre which can accommodate 12 patients. The ship's defensive systems are limited to the command and control of tactical scenarios, communications and non-lethal deterrence systems. The unit is also ready to be equipped with more complex defence systems to become an intelligence and electronic warfare platform.

For the LSS, Leonardo will provide its latest-generation Combat Management System. With open architecture, the modular and reconfigurable system will readily accept systems that the customer may wish to install in future as needs arise. The ship will also carry the Leonardo Janus electro-optic system (with a dual sensor head for 360-degree panoramic surveillance), an integrated communications system (including multi-band satellite systems and the new Software Defined Radio (SDR)), an integrated navigation system and an Interrogator Friend or Foe (IFF) system.

The company will provide the same 25mm remotely-operated turrets as for the PPA and LHD, the ship's Diver Detection Sonar and Obstacle Avoidance Sonar. These will provide comprehensive protection against all types of surface ships, divers and related transport vehicles and the ability to dock in a harbour. MBDA missile systems are not expected to be required for the LSS.

LHD - Landing Helicopter Dock

The LHD is a new multi-role amphibious naval unit. With a displacement of around 25,000 tonnes, the vessel enables amphibious operations to be conducted at long range in the "enlarged Mediterranean". The vessel can perform in a number of contexts with multi-national forces (joint or combined) such as crisis response operations as part of NATO, EU or multi-national coalitions. The LHD will be able to evacuate non-combatants from foreign territories as part of national or international initiatives, humanitarian operations and in the event of disasters, with the ability to coordinate and monitor relief efforts in collaboration with Non-Government Organisations (NGOs).

For the LHD, Leonardo will provide its open architecture Combat Management System, which is modular and reconfigurable and so ready to accept systems that the customer may wish to install in future as needs arise. Leonardo will also equip the LHD with a helicopter approach radar system, a multi-sensor fire control radar (X and Ka Band), a new multifunctional Active Electronically Scanned Array radar with four fixed-face arrays operating in the X-band and a rotating L-band radar for long- range surveillance), Identification Friend or Foe (IFF) sensors and, as with the PPA vessels, the innovative new 'static InfraRed Search and Track (IRST)' sensor.

The LHD's integrated communications system will include multi-band satellite systems, the new Software Defined Radio (SDR) and an integrated navigation system.

The main armament of the LHD will be a Leonardo 76/62 Super Rapid Multi-Feeding Strales gun. The 76/62 gun is equipped with a radar antenna, which can guide projectiles with a precise beam of radio frequency. This allows the vessel to fire DART ammunition (Driven Ammunition Reduced Time-of-flight) very accurately, reducing the risk of collateral damage. The speed of the DART projectiles, combined with their guided capabilities, allows the 76/62 system to counter fast-moving threats whether they be traditional or asymmetrical.

As with the PPA in its "full" configuration, the LHD will be equipped with the Leonardo ODLS 20 decoy launching system as well as the Black Snake towed array sonar and countermeasures, a lightweight and autonomous system for anti-torpedo defence. Leonardo will also provide the vessel's Obstacle Avoidance Sonar, BathyTermograph unit and Diver Detection Sonar. Finally, the LHD will be 'fitted for' potential future air-defence missile systems by MBDA.

Ms. Ayse Evers - Editor in Chief of Defence Turkey Magazine in Fusaro

The Launch Ceremony of Aselsan Academy and Universities Postgraduate Training Program Protocol was Held in Ankara

Aselsan and Four Universities Postgraduate Training Program protocol as well as the Aselsan Academy Launch Ceremony was held in Ankara with the participation of Prof. M.A Yekta Saraç – CoHE (YÖK) - President, Prof. Dr. Mehmet Çelik - Vice President of Aselsan and President of the Board of Aselsan Academy, Prof. İsmail Demir, Undersecretary for Defense Industries and rectors from research universities.

Aselsan and the universities selected as research universities, namely Gazi University, Gebze Technical University, Istanbul Technical University and Middle East Technical University, signed the Postgraduate Training Protocol.

Taking the floor at the launch meeting of the Aselsan Academy, Aselsan Vice President and the President of the Board of Aselsan Academy Prof. Mehmet Çelik noted that they initiated the postgraduate training program of the Aselsan Academy during the autumn semester of 2017 under the auspices of the President and CoHE with the vision of developing technology through qualified staff and with the university-industry cooperation underlining that the most crucial investment in order to achieve the development of products with high added value was the investment made in individuals and continued: “Aselsan Academy is a model with its innovative solutions in respect to increasing the number of qualified and expert staff required by the industry which has been on Turkey’s agenda for a long while, developing technology and know-how through the thesis studies of the staff in an industrial enterprise and furthermore achieving sustainability. The main objective of the program is to shape the courses the staff employed in the defense industry will take and the thesis studies they will conduct in accordance with the projects they work on in the industry. Thus, the students included in the program will be able to accomplish thesis studies on subjects that contain innovative and cutting-edge technology applications, and that directly contribute to the nationalization target of our country while abolishing the export restrictions. Aselsan Academy’s Postgraduate Training Program consists of an exemplary step for the 4th generation university implementation by forming a new system that includes scientists and employees from industrial life.”


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Stating that they launched the program during the fall semester of Aselsan Academy’s 2017 - 2018 with 90 students composed of 22 PhD and 68 postgraduate students,

Prof. Mehmet Çelik - Vice President of Aselsan

Prof. Çelik added that in addition to these 90 students 143 more new students were registered to the spring semester of 2017-2018 academic year. Prof. Çelik told that the Aselsan Academy made a start with 233 students composed of 65 PhD and 168 postgraduate students in its very first academic year and continued: “In order to conduct the Aselsan Academy Postgraduate Training Program in an efficient and effective manner, we established a new structure under our Technology and Strategy Management Directorate. Through this structure, our newly established Directorate acts as a bridge enabling the establishment and sustainment of relations between Aselsan, CoHE, universities and the students. The relations on the university side are provided by the Aselsan Academy Council. This council is composed of the directors or executives of the universities’ institutes of science and Aselsan representatives that are experts in their areas of specialization with PhD degrees at minimum. Issues such as the courses to be opened, the academicians executing the lectures, students accepted in accordance with the application criteria of the university and the thesis subjects within the academic year are being examined by the Aselsan Academy Council and are being submitted to the authorized organs of the universities in order

to be discussed and decided upon. Our program is in line with the CoHE's postgraduate directive and it is being clarified according to the decrees of the authorized organs of the universities and eventually we launch the academic year.

When we take into consideration the identification stage of the thesis subjects which is one of the most critical outputs of the Aselsan Academy, we see that initially the technology road map of Aselsan and technology areas are being identified by considering the existing projects. In addition to the identified technology areas with the contribution of the academicians at the universities included in the program, a data repository is formed for the thesis subjects for 4 engineering departments. As the scientific incidents are being examined in-depth at Aselsan's equity funded R&D projects for interpretation and for reaching new synthesis, this PhD thesis are not considered as doctorate thesis, they are referred to as scientific doctorate thesis. Therefore, the staff receives the same scientific diploma granted by the main campus of the relevant university. After the appropriate student - thesis title is matched up, the lists are examined by the Aselsan Academy Council and then submitted to the universities. Before the academic year starts, the expert academicians who can conduct the courses are being identified by the universities. Amongst those of Aselsan's staff with PhD and higher degrees, the appropriate ones may become candidates for being lecturers and be included in the academician staff. In addition, the 2nd thesis consultancy is being executed again by the Aselsan employees with the same PhD degrees. In this way, the projects are easily associated with the studies conducted as part of the thesis. Thus, the program is executed in line with the science Institute rules of the universities, scientific publications and assertions are prepared and the students graduate with postgraduate diplomas. Aselsan achieved the characteristic of becoming an external campus of the universities with this program. Within the scope of Aselsan Academy Program, as the universities are in different cities and since the thesis may be in areas with national confidentiality, the courses are given at Aselsan's campus. Various halls and classes at Aselsan's premises at Macunköy have been allocated to Aselsan Academy and a proper training environment has been set. Although our existing infrastructure is quite sufficient, for accomplishing the training without interruption, the infrastructural activities for Aselsan Academy's own building are being evaluated by authorized councils taking future requirements into consideration."

Prof. İsmail Demir - Undersecretary for Defense Industries

In his speech at the ceremony, Undersecretary for Defense Industries Prof. İsmail Demir stated that the defense industry should not be considered as a stand-alone branch; it should be regarded as a part of the industry and technology ecosystem and added that while efforts for national and unique products are being exerted in defense industry, similar steps should be taken in many areas such as medicine and energy for extending the success achieved here. Thanking the Aselsan management for filling the "Defense Industry Academy" gap, Prof. Demir continued, "We believe that this system in defense industry is composed of a series of components. We also believe that all employees from the technicians to the engineers should attain a certain level of competence and this should be updated as well." Pointing out that a series of complementary

CoHE President Prof. M.A Yekta Saraç

activities in respect to the Aselsan Academy will be conducted in the future, Prof. Demir added that they will continue to give their energy and support to such projects.

CoHE President Prof. Dr. M. A. Yekta Saraç said that innovations and achievements to be realized in the fields of science and technology would become the key for sustainable and socio-economic development, pointing out how important it is for Turkey to increase competitiveness in the global economy in order to achieve its goals for 2023.

He noted that universities must be more dynamic and innovative than ever in the 21st century in order to keep up with the advancing technology and to fulfill changing needs.

He emphasized that the number of qualified industrial companies increases as Turkey gets better at producing technologies, adding that it also develops the cooperation between universities and the industry.

He stated that they would review the research processes with quality outcomes in research universities and said, "We will further develop the existing policies and strategies. I also would like to say that we have taken steps in the direction of developing special support for our research universities with the help of institutions such as the Ministry of Development, which supports the research infrastructures, and TÜBİTAK, which funds scientific studies."

He underlined that the Aselsan Academy would greatly contribute to the integration of universities with the world and said: "We believe that

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the Aselsan Academy will produce positive results in accordance with the university concept of the new generation. This project is a product of a perspective that is more different and visionary than industrial doctorates. This program will play an important role in increasing the competitive power of our country and will pave the way for the technology-driven transformation process in our industry. In this context, Aselsan Academy, which was introduced today, will also set an example for higher education."

Following the introduction of the program, Prof. Dr. Mehmet Çelik, Vice President of Aselsan and President of the Board of Aselsan Academy, Prof. Dr. İbrahim Uslan, Rector of Gazi University, Prof. Dr. Haluk Görgün, Rector of Gebze Technical University, Prof. Dr. Mehmet Karaca, Rector of Istanbul Technical University, and Prof. Dr. Mustafa Verşan Kök, Rector of Middle East Technical University, signed the "Postgraduate Training Protocol" in the signing ceremony held under the coordination of the Council of Higher Education.

What is the "Aselsan Academy Postgraduate Training Program?"

The Aselsan Academy Postgraduate Training Program was realized in the fall term of 2017. Gazi University, Gebze Technical University, Istanbul Technical University and Middle East Technical University were included in the program, a model carried out with the cooperation of an industrial enterprise and more than one university, under the coordination of the Council of Higher Education. The aim of the program is not only the cooperation between universities and the industry, but also the cooperation between universities. The Aselsan Academy will contribute to the defense industry of Turkey with its specialized and innovative structure in technology and engineering and will enable the restructuring of the programs in this field.

Aselsan has become the external campus of universities within the scope of the protocol signed with CoHE. The "Postgraduate Training Protocol" will allow the Aselsan employees to have the opportunity to do their graduate studies on the fields/projects they work without leaving the campus of Aselsan. The Aselsan employees who will graduate from this program will be eligible to receive a master's or doctoral degree diploma equivalent to the diploma issued on the main campus of the relevant university.

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Universities to be Provided an Environment for Industrial and Technological Projects

The aim of the Aselsan Academy Postgraduate Training Program is to develop and maintain the technology and knowledge of Aselsan. The Council of Higher Education provides an implementation environment for technological projects of research universities and academicians who specialize in various fields.

Experienced faculty members will gain experience in the industry by being directly involved in industrial projects and will contribute to the education and technology of Turkey.

Aselsan Employees to Write a Thesis on Their Ongoing Aselsan Projects

Assigning the employees with academic qualifications to defense projects will accelerate the process of nationalizing and successfully completing important technologies in the defense industry. The employees will have postgraduate training in the defense industry in accordance with the mission and vision of Aselsan.

232 employees have begun to receive education in this manner -168 people are studying for a master's degree and 64 people are studying for a Ph.D. degree in the 2017-2018 academic year at Aselsan Academy. There are 135 students in Electrical and Electronic Engineering, 47 students in Computer Engineering, 45 students in Mechanical Engineering and 5 students in Material Engineering. The aim is that this figure will be 750 next year and the ratio of the employees with doctoral degrees at Aselsan will be at 10% in four years.

Elective Ordinary General Assembly of the Defense & Aerospace Industry Exporters' Association Held in Ankara

Mr. Latif Aral Aliş was re-elected as the President of the Board at the Defense and Aerospace Industry Exporters' Association's Regular General Assembly with the single-listed election. At the meeting in which the export stars of the defense and aerospace industry with increasing exports in recent years were determined, TAI was deemed worthy of the award for the export champion of 2017

The Defense & Aerospace Industry Exporters' Association's (SSI) Elective Regular General Assembly meeting was held at the Association's headquarters in Ankara. At the Regular General Assembly, the existing management was reelected for a four-year period and the awards for the export leaders of the defense industry of 2017 were delivered at a ceremony held prior the General Assembly. TAI was at the top of the list of the companies with the most exports in 2017, and the award to the company conducting export to most countries was granted to the Bahtiyar Av Malzemeleri. BMC received the award for the company increasing its exports most during 2012 - 2017.

Before the opening remarks of the Elective General Assembly Meeting, SSI Defense Industry Sector Director Engin Yalçın made a presentation on the performance of Defense and Aerospace in 2017 according to the data provided by TIM (Turkish Exporters' Assembly).

Turkey Achieves $156 Billion in 2017 Exports

In light of the data shared by Engin Yalçın with the participants, it was underlined that the total exports of all of Turkey's industries reached $156.8 billion with a $14.7 billion increase compared to the previous year. Based on all industries, Turkey's exports were $142 billion in 2016.

Amongst Turkey's export items, Industrial exports received the largest portion with $121 billion, agricultural revenues reached $21.2 billion, Mining reached $4.7 billion and export exempted from the records of the exporters' associations was $9.5 billion. In 2017, European countries remained at the top of the top ten countries with which Turkey conducts the most exports and in 2017, $14.9 billion in exports went to Germany, $10.3 billion to the UK, $8.3 billion to Italy, $8.2 billion to United States of America, $8.1 billion to Iraq, $6.6 billion to France, $6.3 billion to Spain, $3.8 billion to Netherlands, $3.4 billion to Israel and $3.2 billion in exports to the United Arab Emirates were accomplished.

Automotive Industry on Top of the List with Export Revenues of $28.5 billion in 2017

According to Turkey's export data of 2017 based on the industries, the automotive industry took part at the top of the list with $28.5 billion with an increase of 19%, ready to wear and the garment industry was ranked number two on the list with $17 billion where chemicals and goods reached the third rank with $16 billion. The steel industry remained at the fourth rank with $11.5 billion, electrical and electronic goods and services were at the fifth rank of the list with $10.5 billion, textiles and raw materials remained at the sixth rank with $8.1 billion where iron and nonferrous materials took the seventh rank with $6.8 billion, with $6.4 billion in export revenue grains, legumes, oil seeds and products remained at the eighth rank on the list, with $6.1 billion in machinery and parts were at the ninth rank, and mining products were the tenth with $4.7 billion in export revenues.

Defense & Aerospace Industry Export Revenues Increased to $1.74 billion in 2017

With a 3.7% increase on an industrial basis compared to 2016, the Turkish Defense &

Aerospace Industry's total exports reached $1.739 billion in 2017 and took the nineteenth rank amongst exporting industries. In 2016 this figure was realized as $1.677 billion.

In light of the data shared in the presentation, an upward change of 38% was observed in the Defense and Aerospace Industry export data between 2012 and 2017, the export revenue except for services was $1.26 billion in 2012, in 2013 the figure was $1.38 billion, in 2014 it was $1.647 billion, in 2015 it reached $1.654 billion, in 2016 the figure increased to $1.677 billion and eventually in 2017 the export revenue was recorded as $1.739 billion. According to this data, approximately 20% growth was seized especially in 2014 in the export revenues of Defense and Aerospace Industries in Turkey, yet the country failed to maintain this growth in the following years and it achieved an average of 2% growth in the last three years. According to the data provided by the Turkish Exporters' Assembly (TİM), Turkey's average per kilogram in the production of products with added value reached $1.3 where in the Defense Industry this ratio became $39.7 per kilogram.

In 2017, among the top ten products within the breakdown of Defense and Aerospace Industry exports, components and parts of Aircrafts and Helicopters were at the top of the list with $524 million, with $277 million, components and parts of turbojets and turbo propellers for other vehicles remained at the second rank, with $192 million in export revenue turbojets for civil air vehicles were at the third rank, tanks and other armored combat vehicles remained at the fourth rank on the list with $112 million, at the fifth rank we see the smoothbore single-barrel shotguns with $78 million of export revenue, hunting rifles remained at the sixth rank of the list with $42 million, bullets and other ammunition of warfare weapons took the seventh rank with $36 million, with $35 million civil aviation passenger aircrafts remained at the eighth rank, other astronomy devices took the ninth rank with $35 million and other products covered $373 million of exports in the list. In light of these data, the turbojets for civil air vehicles displayed an increase of 200% compared to the previous year where the export of the components and parts of tanks and other armored combat vehicles decreased sharply by 59% from $103 million in 2016.

Sales to NAFTA, European Union and other Asian Countries Increased in 2017 While the Sales to Middle East, CIS, Far East and African Countries Diminish

NAFTA countries remained at the top of the list in Defense and Aerospace Industry exports accomplished on the basis of country groups between 2017 January – 2017 December and a total sale of $709 million was made to NAFTA countries in 2017. With $499 million, European Union countries followed the NAFTA countries where other Asian countries remained on the third rank with $142 million, Middle East countries became fourth at the list with $131 million, CIS was at the fifth rank with $92 million, export to the countries of the Far East at the sixth row reached $71 million and African countries ranked seventh with $64 million. Where Turkey's export to the NAFTA countries was $601 million in 2016, this figure reached $709 million with an increase of 17.9% and an increase of 25% was achieved compared to the previous year in the sales made to the European Union countries. In 2017 the greatest amount of increase was in the export conducted to other Asian countries. The sales realized as $74 million in 2016 increased by 91.3% in 2017 and reached $142 million. A sharp decrease in the sales conducted to the Middle East countries was observed, the $244 million worth sales in 2016 decreased by 46.2% in 2017 and became $131 million. Other regions where a decrease was observed compared to last year were Far East countries with 41%, CIS with 36.2% and African countries with 19.9%. As per these data, a loss of $210 million was observed in Turkey's sales to Middle East, CIS, Far East and African countries in 2017 compared to the previous year. On the other hand, within this period, an increase of $278 million was achieved in the sales conducted to NAFTA, European Union and other Asian countries compared to the previous year.

Opening remarks started upon the completion of sharing 2017's export data

SSI Chairman of the Board: "Our Defense Industry demonstrated its power in Operation Olive Branch"

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Delivering the opening speech after the General Assembly and Award Ceremony, SSI Chairman of the Board Latif Aral Aliş expressed that the Defense and Aerospace Industry Exporters' Association composed of companies operating on critical areas concerning Turkey's security, liberty and future started its activities with 60 members and has been successfully continuing its journey with 600 members. Stating that a few number of countries in the global scale owned the superior technical capabilities reached by the defense and aerospace industry of Turkey throughout the Olive Branch Operation Latif Aral Aliş added, "The greatest support to our heroic Turkish Soldiers are provided again by Turkish engineers and workers. We have the same amount of responsibilities and duties that our armed forces and national police have in the battle fields, border security, homeland security, information security and protecting the peace and welfare of our country."

Stating that the Defense and Aerospace Industry Exporters' Association increased its export volume by 38 percent since its establishment in 2012, Latif Aral Aliş underlined that the total amount of exports of the industry increased to $1,739 billion in 2017.

In his speech, Deputy Undersecretary for Defense Industries Serdar Demirel underlined that the level reached by the industry in a short amount of time was a great success and continued: "For achieving a sustainable Defense Industry, we must expand to abroad. We are aware of the power of the automotive industry, yet we should also bear in mind that the defense industry has the potential of carrying our export volume further. Recently, as Turkey we exported total $800 million defense industry products during a single fair in recent days. We achieved this with great contributions of our statesmen. This indicates that our related governmental authorities, defense industry exporters and decision makers as a whole are exerting great efforts with the awareness of the essentiality of the defense industry. Hereby, I celebrate the SSI President and whole team of the Defense Industry Exporters' Association once again. We wish this coordination would strengthen and continue in the future."

Following the opening remarks, the awards to the companies achieving the most exports in 2017 in defense industry were delivered.

TAI – Turkey's 2017 Defense Industry Export Leader

In the ceremony where the companies conducting the most export in 2017 were awarded, TAI was deemed worthy of the championship award among the members of the SSI and it was followed by TEI, Aselsan, Alp Havacılık and RAM Dış Ticaret A.Ş. Furthermore, in the ceremony, BMC received the award by increasing its export volume most during 2012-2017. The Company Bahtiyar Av Malzemeleri received an award by achieving exports to the highest number of countries (84 countries) in 2017.

Following the award ceremony, the general assembly held elections that would determine the new management. In the election based on a single

Mr. Serdar Demirel - Deputy Undersecretary for Defense Industries

list prepared by Latif Aral Aliş, with a single change in the executive board of the previous term, a selection was made with the votes of all members attending the general assembly and assignments were made for four years. Yurttaş İnşaat that was assigned last year to the management would be representing the Assembly as a Delegate of TİM and Havelsan was assigned to the management of the Assembly instead. The New Executive Board of the SSI consists of the following companies; Sarsılmaz (President), TAI, Aselsan, Roketsan, Havelsan, MKEK, FNSS, Alp Aviation, Bahtiyar Av Malzemeleri, Yonca-Onuk, S.S Huğlu Ev Tüfekleri.

Mr. Serdar Demirel; Prof. Oğuz Borat- Chairman of the Board of TAI, Mr. Latif Aral Aliş - Chairman of the Board of SSI

ICDDA 2018 Press Conference Attracts Considerable Attention

The 4th Industrial Cooperation Days in Defense and Aviation Aerospace (ICDDA) to be held by the OSTIM Defense and Aviation Cluster (OSSA) on 23-25 October 2018 under the auspices of the Undersecretariat for Defense Industries (SSM) and with the support of the Ministry of Economy was introduced at the press conference.

Deputy Undersecretary of SSM Dr. Celal Sami Tüfekçi, Deputy Governor of Ankara Süleyman Hürrem Aksoy, TÜBİTAK Vice President Mr. Orkun Hasekioğlu, Ankara Chamber of Commerce Board Member Ziya Kemal Gazioğlu, OSTIM Chairman Orhan Aydın, OSSA Chairman Mithat Ertuğ, TBMM National Defense Commission Member Dr. Suat Önal, Ankara Provincial Director of Science Industry and Technology Mr. Vehbi Konarılı, representatives from General Directorate of Security, General Command of Gendarmerie, Naval Forces Command, Ministry of Science, Industry and Technology, DHMİ, General Directorate of Civil Aviation, TAI, Aselsan, Otokar, Roketsan, FNSS, Airbus and Lockheed Martin, as well as military attachés from many countries, sector representatives and cluster members attended the meeting held at the Sheraton Ankara Hotel on the 5th of April, 2018 and they once again showed their support to OSSA and to the event.

Mr. Orhan Aydın - the Chairman of the Board at OSTİM

Full Support of the ICDDA Event

At the press conference held at the Sheraton Ankara Hotel, SSM Deputy Undersecretary Dr. Celal Sami Tüfekçi expressed their satisfaction in supporting the ICDDA which is to be held in Ankara, the center of the defense and aerospace industry.

Dr. Tüfekçi stated that more than 5,400 B2B meetings were held with the participation of more than 250 companies from 34 countries in the previous 3 organizations that were coordinated by OSSA.

Dr. Tüfekçi pointed out that the event, which creates a business-oriented platform for local and international suppliers and manufacturers and also provides opportunities for future co-operations, will make a big difference in the Turkish defense sector. "I believe that during this event which will be organized at Hacettepe University Beytepe Congress and Culture Center on 23-25 October, the Turkish defense and aviation companies will provide maximum benefit through the synergy to be generated by turning interest into opportunity", added Dr. Tüfekçi.

Dr. Tüfekçi said that the government, as a sole buyer, directs the sector through procurement projects and for this reason the role of the government in the sector is very important. "This role has become more crucial for making regulations for the sector, strategy setting and guidance with the connection of our Undersecretartiat to the Presidency as per the decree-law no 696 announced on 24 December 2017. We built a system, where the capabilities, products and solutions of companies that have not found a chance to express themselves and have not found any special support for their needs so far, can be determined and supported through the Industrial Competence Evaluation and Support Program (EYDEP) which we initiated in 2016 and which we launched on 22 March 2018."

OSTIM Organized Industry Zone Chairman Orhan Aydın stated that they are happy to be the founder of such a cluster as OSTIM and stated that the SSM's protection of the defense industry

Dr. Celal Sami Tüfekçi - Deputy Undersecretary for Defense Industries

is very important and beneficial for the actors in the sector.

Emphasizing that the OSSA has made important breakthroughs in a short period of time, Aydın said, "Thanks to clustering, we are making efforts so that our SMEs work together and our companies create synergy by coming together. We attach great importance to the fact that the suppliers of the world come to Ankara within the scope of the event and establish cooperation with our SMEs."

OSTIM Defense and Aviation Cluster (OSSA) Chairman Mithat Ertuğ also said that large defense industry companies will participate in the event and over 5000 meetings will be held. Ertuğ said that the organization gives confidence to the SMEs and will contribute to the growth of these enterprises.

Mr. Mithat Ertuğ - the Chairman of the Board at OSSA Cluster

On the first day of the three-day event, discussions on topics such as Civil Aviation, Naval-Air-Land Systems, Homeland Security Technologies and Supply Chain Development are planned to be realized at various panels to be moderated by domestic and foreign moderators. Conferences are planned to be organized where the problems and possible solutions are handled with the participation of public, military private sector and university representatives. On the 2nd and 3rd day of the event, B2B meetings will be organized in which participants of the event with stands and as sponsors come together with national and international big players.

The ICDDA organization offers SMEs operating in the Turkish Defense Industry an opportunity to meet with high-profile national and international companies at a low cost. The support given by the Ministry of Economy for UR-GE projects is also of great importance in increasing the participation of SME companies in the event.

3rd ICDDA Event Achieved a 95% Performance Success Rate

According to the feedback and results of the survey conducted by the OSSA, the ICDDA event achieved a 95% success rate in the appropriateness of companies matched in bilateral meetings and also the satisfaction rate of 95% in the selection and matching of companies conducting bilateral meetings. This success was shared with the stakeholders in the 2017-Q1 Performance Evaluation Report.

More than 200 companies from 33 countries participated in the 3rd ICDDA event, while 5,400 registered bilateral meetings were held during the 3-day event. In addition to many international companies such as Airbus Defense and Space, Airbus Group, Airbus Helicopter, Boeing Company, Dassault Systems, Leonardo Group, Lockheed Martin, MBDA, Navantia, Rolls Royce, Sikorsky, Thales, and our main industrial companies such as Aselsan, Havelsan FNNS, Istanbul Shipyard, MKEK, Otokar, Roketsan, TAI, TEI, Turkish Technic, many industrialists participated in our activity as well.

The ICDDA organization was also awarded with the 2014 Defense Industry Special Award by the Undersecretariat for Defense Industries and the 2017 Special Award of the Defense Industry Promotion through the purchasers participating in the event from abroad and realized effective B2B meetings.

Eurasia Air Show Takes Place in Antalya 25th-29th of April

Turkey's first show-based Aviation Show - the Eurasia Airshow - gathered the aerospace industry companies and aviation aficionados at the Antalya International Airport on April 25th-29th. A business volume of $10 billion has been expected to be created within the organization in which 343 companies leading the aerospace ecosystem and civilian and military delegations from 63 countries participated

81 air platforms were displayed at the static display area of the Eurasia Airshow which was built from scratch over an indoor and outdoor area of 410 thousand square meters at the Antalya Airport and 150 airshows were accomplished at the event. 130 thousand visitors and defense industry professionals participated in the event throughout the five days.

Deputy Minister of Transport, Maritime Affairs and Communications Yüksel Coşkunyürek, Deputy Minister of Industry and Commerce of Russia Oleg Bocharov, Undersecretary for Defense Industries Prof. İsmail Demir, Mayor of Antalya Münir Karaloğlu, Antalya Metropolitan Municipality Mayor Menderes Türel and many invitees attended the opening ceremony of the Eurasia Airshow.

Underlining the distance Turkey has covered in defense and aerospace at the opening ceremony of the Eurasia Airshow, Undersecretary for Defense Industries Prof. İsmail Demir said, "The perception that Turkey could not reach the achievement to become a major player in aerospace started to change significantly. Holding such an Air Show in Turkey displays the level reached by the aerospace industry as well as the importance attached to aerospace. In addition to the impressive development of the Turkish Airlines, when we accumulate the projects besides the civilian area,


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namely the modernization of F16s, our contribution to multi-national A400M program, our participation in the F35 program as a partner country, our satellite projects such as Göktürk-1 and Göktürk-2, T129 "Atak" helicopter, our projects such as the T625 Multi-Role Helicopter, "Hürkuş" Trainer Aircraft, "Hürjet" Aircraft and the Turkish Fighter Jet, and as we consider our various satellite and missile launcher systems as projects we see that Turkey is now a country with a major breakout in aerospace. This Eurasia Air Show constitutes the signal flare of this notion."

Noting that an event critical for aviation/aerospace and space industries was being held, Deputy Minister of Transport, Maritime Affairs and Communications Yüksel Coşkunyürek continued, "Defense and aerospace industries are at the top of the industries utilizing the cutting edge technologies. The axis of world's aerospace has been shifting towards Asia and Turkey is at the conjunction of this axis. Thus we are positioned at a natural line. Many countries of the world could be swiftly reached through short flights. As a result of the liberalization policies, the number of our passengers reached 200 million from 35 million in 2003 and the number of our airports increased to 55 from 26". Underlining that 2018 would be a year of performance Mr. Coşkunyürek added, "Our new airport will be launched on 29 October 2018 and it will meet the demands of the world airport industry. Turkey's airports reached at the 9th rank in respect of the total number of passengers. We expect a traffic of 205 million passengers to emerge."

First Delivered Airbus A350-1000 Aircraft Displayed at the Eurasia Air Show

In addition to the Airbus KC2 Voyager MRTT 330-243 of the British Royal Air Forces, the first Airbus A350-1000 passenger aircraft of the Qatar Airways - that was delivered to the Qatar Airways recently - and the Leonardo C-27J Spartan and Antonov AN-178 aircrafts were on display for the participants at the static display area at the Eurasia Airshow throughout the event.

The Airbus A350-1000 aircraft that was delivered Qatar Airways' fleet was opened to the visitors on the first day of the event, the world's second greatest aircraft Antonov 124 was displayed at the static area throughout the fair while being the first greatest cargo plane making a flight demonstration at an aerospace event in Turkey.

Gendarmerie General Command, National Police and Coast Guard Command staff of Turkey conducted joint flight shows for the first time at the Eurasia Airshow and while the personnel jump out the helicopters and shows the search and rescue operations were accomplished with the participation of Sikorsky S-70, AB 412 and UH-60 helicopters conducted again by the three institutions of Turkey amazed the audience. Turkey's pride in the defense industry – the T129 "Atak "helicopter within the Land Forces Command's inventory was demonstrated at the static display area of the General Staff's Chalet throughout the event and T129 "Atak" helicopter showed its superior maneuvering capability to the participants and visitors throughout the event with its demonstration flights.

An unfortunate disappointment of the Eurasia Air Show was the circumstances with SoloTurk which was announced to take place but was removed from the program later. Yet the Turkish Stars completely substituted the SoloTurk with their spectacular shows and the demonstrations conducted by the world's second greatest cargo plane Antonov 124, MIG-29 of the Polish Air Forces, JAS 39 Gripen as well as C-27J Spartan amazed the audience with their shows. The youngsters and children wishing to become pilots seized the extraordinary experiences with the Bronco Demo Team's nostalgic aircraft OV-10, Air Benders, Red Bull and Artur Kielak's acrobatic flights at the Eurasia Airshow.

The first three days of the event were open only to professionals yet the last two days of the airshow hosted visitors coming from various cities throughout Turkey. Besides, the Boeing 777F, MIG 29, CASA C-295M, Zivko Edge 540 and many more legendary aircrafts crossed paths with aviation aficionados in the event.

Russia Sells 20 Superjet 100s to Iran

The Eurasia Air Show hosted the greatest contract ever made between two countries at an event in Turkey, a contract between the Russian Sukhoi Company and Iran Airtour on the procurement of 20 Superjet 100s. Iran Airtour Company signed the contract of approximately $1 billion regarding the 20 Superjet 100s which will be delivered in 2019. Meanwhile the Russian Sukhoi Company signed a contract of $5 billion by selling a total of 104 Superjet 100s.

Moreover, at the Eurasia Airshow, a cooperation agreement between Otonom Technology and Cappadocia Balloon Maintenance Center was signed regarding Turkey's first domestic hot air balloon development project, a NUMESYS partner company establishment contract was signed between Anova Engineering and Figes A.Ş where ANOVA and Er Machinery companies signed a cooperation agreement regarding the design, development and production of the gear systems utilized at the air vehicles. Additionally, Havelsan and Turkish Technic signed a joint venture cooperation agreement. Witnessed by the Undersecretary for Defense Industries Prof. İsmail Demir a cooperation protocol on the "Localized Production and Integration of the Fire Detection and Prevention Systems" was signed between Alp Aviation and one of the United Technologies Corporation companies the UTC Aerospace Systems / KIDDE Aerospace & Defense.

A contract for the development of the RF and electro-optical systems to be used by the Turkish Fighter Jet program was signed between Aselsan and TAI as well.

UTC Aerospace Systems Signed Agreement with ALP Aviation to Begin Phase Production of Kidde Fire Protection Systems in Turkey

At a signing ceremony at the Eurasia Airshow on the 25th of April, UTC Aerospace Systems signed a wide memorandum of understanding with Alp Aviation covering much of the company's Sensors & Integrated Systems business unit. As part of the agreement, the two companies will cooperate to begin phased production of components within UTC Aerospace Systems' Kidde Dual Spectrum automatic fire/explosion suppression (AFES) systems for military ground vehicles at Alp Aviation's campus in Eskisehir, Turkey. By providing a localized product that meets Turkish requirements, the two companies will work together to support Turkish original equipment manufacturers building military ground vehicles for the Turkish military, including the Turkish Land Forces.

Fitted on more than 275,000 vehicles in 20 countries, the AFES system comprises extremely fast and highly accurate Dual Spectrum sensors that detect fires and explosions in zones such as crew areas and mechanical compartments. The AFES extinguishers are equipped with high-speed valves to immediately flood affected compartments with efficient and approved extinguishing agents. Typical reaction times from detection to full suppression are within milliseconds. Fire or explosions caused by rounds penetrating the vehicle are effectively suppressed by this near-instantaneous response.

Work is expected to begin at Alp's Eskisehir facility in the coming months. The Turkish military ground vehicle market includes roughly 850 vehicles built each year.

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"We're excited to announce our partnership with Alp Aviation, covering numerous product lines across the Sensors & Integrated Systems business unit," said Mark Skarohlid, Vice President of Business Development for Sensors & Integrated Systems at UTC Aerospace Systems. "Our portfolio of products and the capabilities of Alp Aviation are well aligned to serve Turkey's domestic markets."

"We look forward to building on our relationship with Alp Aviation," said UTC Aerospace Systems Kidde General Manager Erin McCleave. "We welcome the opportunity to explore areas of cooperation between Kidde Aerospace & Defence and Alp, including the military ground vehicle market as well as aerospace markets."

"We are proud of this accomplishment and to further strengthen our relationship with UTC Aerospace Systems. We will continue to work hard in bringing the most up-to-date technology to Turkey and increasing our work share with additional projects," said Senay Idil, General Manager, Alp Aviation.

"With this project, it is targeted to produce and export these products with an increasing domestic added value. Having a wide range of implementations including land, air and marine vehicles as well as commercial vehicles, intelligent buildings and industrial structures; a technological achievement would be attained in this field with the domestic production, with after-sales support and export of the fire prevention systems being one of the longer-term targets of this partnership.

"Localization of the system together with the local subcontractors and business partners will provide substantial gains for our country and sector. We have demonstrated our ability and are committed to meeting UTC Aerospace Systems' high quality, cost and delivery standards. We have achieved this by investing in not only manufacturing technologies, but our people. As a company, we are eager to support UTC Aerospace Systems capitalize on significant growth opportunities."

Havelsan and Turkish Technic to Establish a Joint Venture Company for "In-flight Entertainment Systems and Internet Service"

Havelsan and Turkish Technic signed an agreement for the establishment of a joint venture company to operate "In-flight Entertainment Systems and Internet Service" during the Eurasia Air Show

In the signing ceremony where Ahmet Karaman - Turkish Technic General Manager and Ahmet Hamdi Atalay - Havelsan General Manager provided their signatures, Turkish Technic General Manager Ahmet Karaman answered press questions said that Turkish Airlines will use such 'In-flight Entertainment Systems' which are to be produced by this joint venture, in most of the aircraft to be procured after 2020 and continued: "The integration of this system has been completed on approximately 44 aircraft of Turkish Airlines. For about three years we have been working together with Havelsan on this area. Havelsan is responsible for the software of this system and Turkish Technic is responsible for the hardware. We are actualizing an indigenous system as a result of this successful cooperation. Every passenger on the aircraft will be able to connect practically from a mobile phone or tablet to the in-flight entertainment system. There is an important market in this regard in the world, and we assess that a significant demand from domestic and foreign markets will emerge for this product. We can use this system not only in airlines, but also in railways and buses".

Karaman underlined that this project was received not because they are a company of Turkish Airlines but because they are one of the big companies in the market and said, "We set forth the most effective solution in terms of both price and quality, and we received this project leaving many companies behind".

Havelsan General Manager Ahmet Hamdi Atalay stated that Havelsan and Turkish Technic have been working toward this system with their own commercial identities until now and said, "Havelsan was working on this system with its own commercial identity and Turkish Technic with its own commercial identity. With the agreement signed today, we have established a joint venture company, the activity of which is solely an 'in-flight entertainment system'. This company will operate in this field both within the country and abroad".

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Emphasizing that Havelsan has put forth a very good technical solution compared to those companies dominating the market on this field, Atalay stated that together Havelsan and Turkish Technic have installed this system on 44 aircraft so far but these systems have not been put into service yet.


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Mr. Ahmet Karaman; Mr. Ahmet Hamdi Atalay

The Wireless IFE (SKYFE), developed jointly by Havelsan and Turkish Technic, was approved by the European Aviation Safety Agency (EASA), and with this approval, mass production of SKYFE was launched. SKYFE has successfully completed the EASA Certification process for BOEING 737-800 aircraft.

Passengers will be able to connect to the In-Flight Entertainment System developed in Turkey via their personal electronic devices over IOS, Android and web apps and will have the opportunity to enjoy spending quality time during the flight. The system is one of the successful examples of Havelsan and Turkish Technic's rising domestic participation in the civil aviation sector. The system developed by Havelsan and Turkish Technic for 3 years under the Strategic Business Alliance Agreement was tested on the Turkish Airlines' JFO tail numbered BOEING 737-800 type "Edirne" passenger aircraft.

Er Machine Gear and Anova Signed a Cooperation Agreement

OSSA member Er Machine Gear, the leader in the field of precision gear systems which provides products and services to the Turkish Defense Industry and Aviation sector and Anova which provides services in the same sectors with the same sectors in the field of advanced engineering signed a cooperation agreement which is a goodwill agreement aiming to establish a business cooperation in the design, development and production of gear systems in aviation vehicles. It was signed on the second day of the Eurasia Air Show 2018. This agreement was signed by Dursun Öner and ER Machine General Manager Fatih Erdoğan from Anova company partners.

Figes and Anova Engineering Establish a Joint Venture - NUMESYS Software Systems

According to the agreement signed by Anova Engineering and Figes on the third day of the Eurasia Air Show, a joint venture titled NUMESYS Software Systems was established

In his speech at the signing ceremony, the founding partner of Anova Engineering Emre Öztürk stated that they have been planning this venture for years in order to extend simulation technologies in Turkey and enable their proper utilization. Expressing that they started to actualize their plans during the last year, Öztürk announced the establishment of the joint venture as of that day.

General Manager of Figes, Koray Gökalp noted that the union of the two companies gathered different disciplines and created a giant engineering infrastructure and added, "We will both sell software and execute engineering projects together."

With this agreement the aim is for the proper and extensive utilization of the world's greatest computer driven software engineering company ANSYS's software in addition to extending simulation technologies and maintaining their continuous integration to R&D procedures.

Otonom Technology and Cappadocia Balloon Maintenance Center to Develop Unique Hot Air Balloon

On the second day of the Eurasia Air Show, a signature ceremony for the "Cooperation Agreement on the Development of the Unique Hot Air Balloon Project" was held between Otonom Technology and Cappadocia Balloon Maintenance Center.

This project was initiated by the Cappadocia Balloon Maintenance Center - one of the leading companies of the hot air balloons in Turkey. Otonom Technology aims to contribute with its know-how and experiences in aviation and air stat flight techniques as well as design, analysis and certification processes.

Flights with hot air balloons could be conducted all around the world where climate conditions and landforms allow and in addition to these characteristics, the Cappadocia region has become a worldwide brand in balloon tourism due to its tourism potential, distinct topography as well as its lengthy four season long availability for balloon flights and has turned into the world's greatest commercial flight center over a 20 year period. The hot air balloons used in Turkey are being imported from Europe including their mechanical parts, and with this project the design, development and certification of the hot air balloons are aimed through domestic facilities. With the launch of domestic hot air balloons, a critical export potential in the mid-term is anticipated to be an excellent gain for Turkey.

Women in Air & Space Symposium

In promotion of encouraging gender balance in aviation and space technology fields, a symposium entitled "Women in Air and Space" was held as part of the Eurasia Air Show.

The "Women in Air and Space" symposium that took place at the International Flights Terminal of the Antalya Airport gathered the professionals operating in military/civil areas, academic staff and relevant parties.

Delivering the opening remark of the symposium, Athina Kapeni, the Vice President of Çelebi Holding in Charge of Global Sales and Marketing, touched upon the social and cultural responsibilities of women, figures on the distribution of genders in the business in the world and Turkey, characteristics of women and men and their influences on the business world and the difficulties airwomen have been experiencing.

Within the scope of the symposium which attracted heavy attention from both domestic and foreign participants, 3 panels were held with the themes "Entrepreneurship", "Space" and "Women in Air and on Ground."

The closing address of the symposium was delivered by Can Erel, Deputy Director General of Civil Aviation. Erel started his speech by presenting the women who dedicated themselves to aviation and who were first in their professions and said: "The Directorate General of Civil Aviation that is the civil aviation authority of the country issued a directive in March as part of developing the social gender balance in civil aviation and with this directive it became the first civil aviation authority that issued such a directive across the world. In parallel with this directive, we formed a commission for the development of social gender balance in order to monitor the social gender balance, conduct activities enabling the equality of opportunity among genders in selecting aviation as a profession and especially encourage women toward training in aviation. The commission is composed of eight permanent members and two substitute members. Four of the eight permanent members are from the industry and the remaining four are from the Directorate General of Civil Aviation. This commission will gather twice a year and the tasks of the commission will be to identify the principles and objectives of the events to be held to this end. The commission will monitor all intellectual events related with the women in aviation held in our country and across the world and will support and participate in the events it deems necessary. Through attending events held on a global scale such as conferences, forums and panels, it will also announce such events to the public via our website. Moreover, the commission will organize activities towards increasing awareness for creating opportunities in aviation particularly for women. This commission will also form a registry for the women who were first in their professions in concern with civil aviation. Thus, the airwomen, who were first in their areas, will have a registration number".

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Mr. Can Erel – Deputy Director General of Civil Aviation

Following the closing speech of the Deputy Director General of Civil Aviation Can Erel, the panelists attending the symposium and the sponsors supporting the organization of the event were presented with plaques in memory of the day and the symposium ended with a group photo.

Aselsan Middle East Signs a Contract at SOFEX 2018

Aselsan signed a contract on the second day of the 12th Special Operation Forces Exhibition Conference and Fair SOFEX 2018 that took place in Amman, Jordan. At the event, it was announced that a Memorandum of Understanding for the strategic cooperation on "Security Products and Systems" was signed between Aselsan Middle East (AME), Jordan's JOSECURE (Jordan International Security Company LLC) and Aselsan Turkey

Aselsan signed a significant contract at the 12th Special Operation Forces Exhibition Conference and Fair SOFEX 2018 launched by Abdullah II of Jordan. 99 official delegations and over 400 members from 53 countries attended the event.

On the second day of the event, the signing of a Memorandum of Understanding for strategic cooperation on Security Products and Systems by Turkey's leading defense company Aselsan (with Aselsan Turkey's joint venture Aselsan MIDDLE EAST) and KADDB Investment Group (with JOSECURE - one of Jordan's KADDB Investment Group's companies) was announced.


© Aselsan

Aselsan Middle East Building a Bridge

Acting as a bridge between Turkey and Jordan and between KADDB and Aselsan, on account of its many years of experience and know-how Aselsan Middle East conducts production, marketing, distribution, technical support and after sales services activities in order to fulfil the demands of the Jordan Armed Forces, civil associations in Jordan and moreover for the friendly nations in the region on numerous military electronic systems / products, the electro - optical systems being in the first place.

In addition to its vast experience and worldwide recognition in the development and production of communication systems, electronic warfare systems, radars and intelligence systems, command and control systems, defense technology systems, electro - optical systems Aselsan designs, develops and sells Security Products and Systems.

JoSecure Provides Consultancy as well

With its many years of experience JoSecure has been offering Security Services to governmental and national private and public companies of Jordan (Hashemite Kingdom of Jordan) and providing Integrated Security Systems, hardware and technical consultancy services.

The mutual understanding reached through this contract enables the transfer of certain technical information and the parties are able to conduct business negotiations to seize the potential opportunities related with the promotion, marketing and procurement of Aselsan Security Products and Systems mainly in Jordan and in potential neighboring countries. The signed Memorandum of Understanding will be the basis of the new cooperation built to this end.

Through this cooperation the previously established relations will be carried to a more efficient next stage and thus providing the most developed security solutions to Jordan. This will enable the better fulfilment of customer demands by forming a Jordan based stronger supply base with KIG company's reliable partner Aselsan Turkey's great support and contributions.

Integration of SOM-J Missile into F-35 JSF Forge Ahead

The designer and manufacturer of the F-35 Joint Strike Fighter, American company Lockheed Martin, has released a publicity video of the SOM-J stand-off -missile developed by Roketsan on its official YouTube channel. Noting that the SOM-J was developed for airborne, especially intensified protected targets, Lockheed Martin stated that the project is conducted jointly with Roketsan. Lockheed Martin is performing integration activities for the installation of the SOM-J missile at the internal weapons bay of the aircraft.

SARES and Atılım University's Success Stories Workshop on Turkish Aviation and Sustainable Aviation Research

The workshop encompassing the main theme of "Success Stories in Turkish Aviation" was held in Ankara on 19-20 April 2018 and led by the SARES (Sustainable Aviation Research Society) and hosted by Atılım University.

Prominent directors, scientists, researchers and engineers who served and contributed to Turkey in aviation as well as our crucial defense industry associations were invited to the Workshop and the event was realized with the contributions of Roketsan, Aselsan, TEI and TÜBİTAK Sage.

Atılım University's President Prof. Yıldırım Üçtuğ, Vice President Prof. Yılmaz Kaptan, SARES Society's President Prof. Hikmet Karakoç and Atılım University Civil Aviation Academy Director Prof. Nafiz Alemdaroğlu delivered the opening remarks of the Workshop and Deputy General Director of the General Directorate of Civil Aviation Can Erel attended the Workshop as well as Metropolitan Municipality Mayor of Eskişehir and former President of the Anadolu University Prof. Yılmaz Büyükerşen, TAI's former General Director, TSKGV's former General Director and TAI Executive Board's former President Mr. Saim Dilek, former Undersecretary for Defence Industries, CCN Holding Executive Board Member and General Manager Murad Bayar, Roketsan President Selçuk Yaşar, MyTechnic President of the Board Yavuz Çizmeci, Rt. Major General Fazıl Aydınmakine, Prof. Cahit Çıray, Prof. Nuri Saryal, Prof. Ahmet Şevket Üçer, Prof. Ünver Kaynak, on behalf of Aselsan Dr. Halidun Fildiş, TEI Design Engineering Director Ahmet Fındık, TÜBİTAK-Sage Business Development and Strategy Unit Manager Mr. Ahmet Yaşar Özen, TAI UAV Engineering Director Mr. Remzi Barlas, TAI UAV Engineering Structure and Aircraft Systems Manager Mr. Bülent Korkem participated in the Workshop as speakers and conveyed their experiences to participants.

The establishment of the Turkish aircraft industry, past and present of our defense industry, developments in this area, transition from joint production to indigenous products and designs, the distance covered in civil aviation training activities, developments and achievements of our country's defense and aviation projects, air vehicle design and prototype activities, maintenance and repair services, aircraft engine and missile development activities were examined at the Workshop and the experiences were shared with the younger generation.

Atılım University's Vice President Prof. Yılmaz Kaptan

Atılım University Civil Aviation Academy Director Prof. Nafiz Alemdaroğlu

Deputy Director of the Directorate General of Civil Aviation Can Erel and Prof. Ünver Kaynak

Atılım University President Prof. Yıldırım Üçtuğ and Metropolitan Municipality Mayor of Eskişehir Prof. Yılmaz Büyükerşen

Metropolitan Municipality Mayor of Eskişehir Prof. Yılmaz Büyükerşen

Prof. Cahit Çıray

MyTechnic President of the Executive Board Yavuz Çizmeci and President of the SARES Society Prof. Hizmet Karakoç

TÜBİTAK's "Industrial R&D Support" Ratio Enhanced

The support rates within the scope of the Industry and R&D Projects Support Program have risen to 75% for SME companies and 60% for large scale companies

According to a statement made by Prof. Hasan Mandal, the President of the Scientific and Technological Research Council of Turkey (TÜBİTAK), the support provided to sector players within the scope of the "Industrial R&D Projects Support Program" increased by 40% and 60%.

Sharing his views on the subject with the public, Prof. Mandal said, "The support rates have become 75 percent for SMEs and 60 percent for large-scale companies." Stating that the Industrial R&D Projects Support Program, which is aimed at encouraging the R&D activities of companies that created added value, was established in 1995 in order to contribute toward enhancing Turkish industry's ability in this area, Prof. Mandal stated that the R&D projects are supported regarding the production of new products in the private sector, development and improvement of existing products, improvement of product quality and standards, development of new techniques and production technologies enabling cost reduction. He noted that since 1995 to 2010, the Industrial R&D Projects Support Program was carried out by TÜBİTAK and the Undersecretariat of Foreign Trade (DTM) and that since 2011 it has been continued by TÜBİTAK. Prof. Mandal said, "A total of 15 thousand 238 project applications have been made so far within the framework of the program. The total amount of support paid to projects has reached 6 billion TL, which constitutes 72 percent of the amount already paid within the scope of technology and innovation support programs."

"TÜBİTAK will Continue to Support R&D Processes"

Referring to the fact that the implementation principles and procedures of the Industrial R&D Projects Support Program were reevaluated at the Scientific Committee Meeting of TÜBİTAK in line with the views of the stakeholders, Prof. Mandal pointed out that some changes were made in order to contribute to R&D-focused project development processes of the companies. Before such changes, the support rate of 40-60 percent, applied to all institutions without any distinction as SMEs and large-scale organizations, was revised in line with other technology and innovation support programs. Prof Mandal: "The support rates as per such changes were fixed at 75 percent for SMEs and 60 percent for large scale companies. The increase in the support rates of the Industrial R&D Projects Support Program will be effective as of January. TÜBİTAK will continue its initiatives to assess and, where necessary, improve existing processes, taking into account the views of relevant stakeholders for R&D-oriented development."

Arlan Armored Vehicle Loaded into TurAF A400M

An Airbus A400M new generation transport aircraft (tail number 15-0051) belonging to the Turkish Air Force (TurAF) has successfully demonstrated the loading of an Arlan multirole wheeled armored vehicle for the first time during an exercise performed at KADEX in Kazakhstan.

The A400M unique cargo design allows it to carry up to two Arlan vehicles, with a combat weight of 16 tons each and a height of 3.4meters.

The Arlan vehicle is already in operation in the Kazakhstan Armed Forces. The A400M can transport heavy and outsize loads that are too large or heavy for other tactical aircraft. It is capable of loading wheeled or tracked armored vehicles, helicopters, construction and humanitarian vehicles such as cranes, excavators or motor graders. The A400M can transport up to 37t of payload in a nonstop flight covering 1.780 nm (3.300 km). The picture shows the loading of the Arlan into the TuRAF A400M.

Turkish Airlines Selects GEnx Engines to Power Boeing 787 Dreamliners

GE Aviation's GEnx-1B74/75 engines will power Turkey's flag carrier Turkish Airlines' 30 Boeing 787-9 Dreamliners (25 firm and five options), which were ordered in March 2018. The airline also signed a 15-year TrueChoice Flight Hour agreement with GE for maintenance, repair and overhaul for the GEnx-1B engines ordered.

"The GEnx engine offers the optimum reliability, utilization and fuel efficiency of any engine on the Boeing 787 Dreamliner and will properly suit Turkish Airlines' needs as we continue to enhance our aircraft fleet with modern aircraft technologies," said M. İlker Aycı, Turkish Airlines Chairman of the Board and the Executive Committee.

"Turkish Airlines' order affirms the confidence that operators have in the reliability and performance of the GEnx engine, which is the most popular engine powering the B787 Dreamliner," said Chaker Chahrour, VP Global Sales & Marketing at GE Aviation. "This order further strengthens our relationship with Turkish Airlines, and we look forward to the GEnx engine joining the airline's growing fleet," he added.

GE Aviation has sold more than 2.000 GEnx engines in less than 15 years since launching the program, solidifying it as the fastest selling high-thrust GE engine in history. With the most advanced technologies and materials, the GEnx has the highest reliability and utilization, lowest fuel burn and longest range capable of any engine available on the B787 aircraft. The highest-pressure ratio compressor in commercial service today enables the best fuel efficiency in its thrust class, resulting in the GEnx engine powering the longest B787 routes. The GEnx's innovative lean burning twin-annular pre-swirl (TAPS) combustor dramatically reduces NOx and other regulated gases below today's regulatory limits and enhances durability. As the world's first commercial engine with both a carbon fiber composite front fan case and fan blades, the GEnx fan module is lighter in weight, corrosion resistant with less line maintenance and improved reliability, and is the quietest engine GE produces. These leading-edge technologies and engine architecture bring high operational reliability and result in a high utilization rate of GEnx-powered B787 aircraft for more flights per year and more revenue for airlines.


© Turkish Airlines

The GEnx engine has significant ties to the Turkish aerospace industry. The Turkey Technology Center in Gebze, Kocaeli and its 400 engineers helped design the GEnx engine along with other commercial, military and industrial engines. TUSAS Engine Industries, Inc. (TEI), which was founded 33 years ago and of which GE holds a 46 percent share, manufactures close to 40 GEnx components.

Turkish Airlines said in March 2018 it would purchase up to 30 B787-9 aircraft from Boeing, as well as another 30 A350-900 (25 firm and five options) aircraft. All of the aircraft will be delivered by the end of 2024. The airline has selected Trent XWB engines for A350-900s and a contract was awarded in March 2018 to fit Trent XWB engines in 25 Airbus A350-900 aircraft with TotalCare service support. Turkish Airlines also has options to additionally power five A350-900 aircraft with Trent XWB engines.


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Airbus and Dassault Aviation Join Forces on Future Combat Air System

Europe's leading aerospace companies Dassault Aviation and Airbus on April 25, 2018 announced they have decided to join forces for the development and production of Europe's Future Combat Air System (FCAS), which is slated to complement and eventually replace current generation of Eurofighter and Rafale fighter aircraft between 2035 and 2040.

The partnership, sealed in Berlin by Eric Trappier, Chairman and CEO of Dassault Aviation and Dirk Hoke, Airbus Defense and Space (ADS) Chief Executive Officer (CEO), represents a landmark industrial agreement to secure European sovereignty and technological leadership in the military aviation sector for the coming decades, the two companies said.

"Never before has Europe been more determined to safeguard and foster its political and industrial autonomy and sovereignty in the defense sector. Airbus and Dassault Aviation have absolutely the right expertise to lead the FCAS project. Both companies are already cooperating successfully on Europe's medium altitude long endurance new generation drone program," said Dirk Hoke, CEO of ADS. "FCAS takes this successful cooperation to the next level and we are absolutely committed to tackling this challenging mission together with Dassault Aviation. The schedule is tight, so we need to start working together immediately by defining a joint roadmap on how best to meet the requirements and timelines to be set by the two nations. It is therefore of key importance that France and Germany launch an initial joint study this year to address this task."

Eric Trappier, Chairman and CEO of Dassault Aviation, said: "We are convinced that by deploying our joint expertise, Dassault Aviation and Airbus can best meet the operational requirements of the Forces in the development of this critically important European program. Both companies fully intend to work together in the most pragmatic and efficient manner. Our joint roadmap will include proposals to develop demonstrators for the FCAS program as of 2025. I am convinced that European sovereignty and strategic autonomy can and will only be ensured through independent European solutions. The vision that France and Germany have set forth with FCAS is a bold one and it's an important signal in, and for, Europe. The FCAS program will strengthen the political and military ties between Europe's core nations and it will reinvigorate its aerospace industry."

© Airbus

Overall, 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.

Sikorsky Begins CH-53 King Stallion Heavy Lift Helicopter Deliveries to the U.S. Marine Corps

Sikorsky, a Lockheed Martin company, delivered the first CH-53 King Stallionhelicopter to the U.S. Marine Corps (USMC) on 16 may. The aircraft is the first of an expected 200 helicopters for the Marine Corps' fleet.

The CH-53K is the new build replacement for the U.S. Marine Corps' aging CH-53E Super Stallion fleet. The CH-53E first flew in 1974 and entered service with the USMC in 1981.

"Our first delivery of a CH-53K to the Marine Corps marks the start of a new generation of true heavy lift helicopter deliveries by Sikorsky that bring unsurpassed and expanded capability across the modern battlefield to provide tremendous mission flexibility and efficiency in delivering combat power, humanitarian assistance or disaster relief for those in need," said Dan Schultz, Sikorsky President and former CH-53 pilot. "With 18 additional aircraft in various stages of production already, the entire Sikorsky team, in partnership with our suppliers, is looking forward to additional deliveries to delight our customer."

This first CH53K heavy lift helicopter will be stationed at Marine Corps Air Station New River in Jacksonville, North Carolina.

There the helicopter enters into the Supportability Test Plan. U.S. Marines will conduct a logistics assessment on the maintenance, sustainment and overall aviation logistics support of the King Stallion. This assessment also will validate maintenance procedures with Marine Corps maintainers conducting hands-on care/upkeep of the aircraft. The Supportability Test Plan will ensure readiness and support on the flightline when CH-53K helicopters enter into service with the USMC.

Sikorsky expects to deliver its second CH-53K helicopter to the USMC in early 2019.

The CH-53K test program recently completed the following milestones: maximum weight single-point cargo hook sling load of 36,000 pounds (16,329 kilograms); forward flight speed of over 200 knots; 60 degrees angle of bank turns; altitude of 18,500 feet mean sea level (MSL); 12-degree slope landings and takeoffs; external load auto-jettison; and gunfire testing.

"I am very proud of the work accomplished to deliver the most powerful helicopter ever designed into the hands of our Marines," Lt. Gen. Steven Rudder, Deputy Commandant for Aviation, said. "And confident in the teamwork and dedication in this program which will carry us to IOC (Initial Operational Capability) next year."

Sikorsky is preparing its manufacturing facility in Stratford, Connecticut, to house CH-53K production beginning this summer.

The heavy lift helicopter made its international debut and showcased its maneuverability and advanced fly-by-wire technology during demonstration flights at the recent ILA Berlin Air Show in Berlin, Germany

Leonardo Demonstrates First Satellite Controlled MALE Class Drone

On May 23, 2018 Leonardo announced successful completion of the first flight campaign to demonstrate satellite control of a European-built MALE-class (Medium Altitude Long Endurance) drone.

A team comprising Telespazio (Leonardo 67%, Thales 33%) and Piaggio Aerospace carried out the activity using a remotely-piloted P.1HH HammerHead aircraft as the test bed, developing and integrating capabilities that will enable drones to safely fly in unsegregated air space, beyond the range of ground-based radio coverage (called BRLOS - Beyond Radio Line of Sight).

The campaign was carried out at Birgi Airport in Trapani, Italy in order to evaluate the efficacy of the satellite technology for various dual-use applications under realistic conditions. The flights are in line with the objectives of the DeSIRE II European research project, led by Telespazio and jointly initiated by the European Space Agency (ESA) and European Defence Agency (EDA).

The test comes as Europe is showing more interest in homegrown satellite navigation for drones, which is considered crucial to developing an autonomous UAV able to fly without GPS.

The long awaited "European Medium-Altitude Long-Endurance Remotely Piloted Aircraft (MALE RPAS)", to be built by Airbus, Dassault and Leonardo, will fly using Europe's new Galileo satellite system for navigation, even if it will initially also use GPS as a backup.

Airbus, Dassault Aviation and Leonardo Reaffirm Their Total Commitment in the First Fully European MALE Program

The first full scale model of the European Medium-Altitude Long-Endurance Remotely Piloted Aircraft (MALE RPAS) was unveiled on April 26, 2018 during a ceremony held at the 2018 ILA Berlin Air Show.

The reveal ceremony, led by Dirk HOKE, Airbus Defense and Space Chief Executive Officer (CEO), Eric TRAPPIER, Dassault Aviation Chairman and CEO and Lucio Valerio CIOFFI, Leonardo's Aircraft Division Managing Director, confirms the commitment of the four European states and industrial partners to jointly develop a sovereign solution for European Defense and Security.

The unveiling of the full-scale model and the reaffirmed commitment comes after a nearly two-year definition study that was launched in September 2016 by the four participating nations Germany, France, Italy and Spain and follows the Declaration of Intent to work together on a European MALE unmanned aerial system signed by the countries in May 2015.

"While still a lot of work lies ahead of us, this full-scale model represents a first milestone of what Europe can achieve in a high-technology sector if it bundles its industrial strength and know-how" said Dirk HOKE, CEO of Airbus Defense and Space. "The MALE RPAS will become an integral part in guaranteeing Europe's sovereignty in the future. This program is ideally suited to meet urgent capability requirements of Europe's Armed Forces. This innovative partnership also eases the countries' constrained budgetary situation through clever pooling of research and development funds." He added.

"Unmanned technologies and their applications represent one of the key technological foundations for the future evolution of European Defense Industries" said Lucio Valerio Cioffi, Leonardo's Aircraft Division Managing Director. "The European MALE RPAS is orientated to foster the development of high technologies and will contribute to sustaining key competencies and jobs within Europe providing Armed Forces with a high performance and sovereign operational system" he added.

MALE RPAS Program

The characteristics of the first unmanned aerial system designed for flight in non-segregated airspace will include mission modularity for operational superiority in intelligence, surveillance and reconnaissance, both wide area and in-theatre.

The nation's agreement on the air vehicle configuration in mid-2017, selecting a twin-turboprop propulsion system, will supply ample on-board energy for the mission system, and provide proper redundancy to limit restrictions when operating over European densely populated ground and unrestricted airspaces. In January 2018, the MALE RPAS successfully passed System Requirements Review (SRR), which initiated the second phase of the definition study to lead to a System Preliminary Design Review (SyPDR), scheduled for the end of this year.

The SyPDR will demonstrate the quality and fitness for the proposed design. "Air Traffic Integration" and certification are key objectives, giving the participating States full confidence that the development step can be launched with acceptable residual risks.

Preparations for the next stage (development, production and initial in-service support) are already well under way. Entry-into-service of European MALE RPAS is planned for the middle of the next decade.

Federico Martinengo FREMM Frigate Delivered to Italian Navy; Powered by GE LM2500+G4 Marine Gas Turbine Propulsion System

On May 11, 2018 GE's Marine Solutions announced that the seventh multi-purpose FREMM frigate Federico Martinengo, was recently delivered to the Italian Navy by Fincantieri shipyard. All of the Italian Navy's new Carlos Bergamini-Class FREMM frigates (10-ship program) feature the same power dense GE LM2500+G4 gas turbine in a COmbined Diesel eLectric And Gas turbine (CODLAG) propulsion system.

In 2013, Fincantieri delivered the first Italian FREMM, Carlo Bergamini. In addition to the Italian FREMM frigates, DCNS shipyard in Lorient, France, is well underway having delivered six FREMM frigates in a 10-ship program. These sophisticated surface combatants use the same 35.3-megawatt LM2500+G4 gas turbine. Eight of the FREMM frigates are for the French Navy, and single ships have been delivered to the Moroccan and Egyptian Navies.

Fincantieri ship designs using GE LM2500 family of engines are being considered by other international navies including the United States' new guided missile FFG(X) frigate and Australia's SEA 5000 frigate. GE has delivered more than 700 marine engines to the U.S. Navy, providing 97% of the commissioned propulsion gas turbines for this fleet. The Turkish Navy also has extensive experience and an established logistics support program in place for GE LM2500 family of gas turbines.

The GE LM2500 family includes the base LM2500 (25.1 MW), the LM2500+ (30.2 MW) and the LM2500+G4 (35.3 MW). The LM2500 is one of the most reliable and proven gas turbines in the market with over 15 million hours in marine applications and another 90+ million hour in industrial applications. As of May 2018, 1.450 GE gas turbines have been delivered onboard 646 naval ships serving 35 navies worldwide. The large worldwide fleet of GE marine and industrial gas turbines has a 98% availability and 99% reliability.

Separately, GE LM2500+G4 marine gas turbines will soon power the Italian Navy's new Pattugliatori Polivalenti d'Altura (PPA) multipurpose offshore patrol ships. GE's contract includes an order for seven LM2500+G4 gas turbines. The ship's flexible and unique hybrid propulsion plant will feature small gearbox mounted-motors for low speed operations, two propulsion diesels for mid-speed service and the LM2500+G4 gas turbine to reach 32+ knots. GE also will be responsible for the electrical system integration of the hybrid system.

The PPA project is an example of the GE Store: the LM2500+G4 gas turbines will be built in Evendale, Ohio; Avio Aero will manufacture the LM2500+G4 turbine control system at its facility in Brindisi, Italy; and GE Power Conversion will manufacture the drives.

Land Ceptor on Target in Latest Success for MBDA's CAMM Interceptor

MBDA announced that its Land Ceptor air defense system successfully destroyed its target (Krotos BQM-167 droone) during an end-to-end system demonstration firing at the Vidsel Test Range in Sweden on May 28, 2018, an important milestone for the project prior to entry to service with the British Army.

Land Ceptor utilizes the proven Common Anti-air Modular Missile (CAMM) currently in production and delivering a common stockpile to meet the air defense needs of both the British Army and the Royal Navy (as Sea Ceptor). In British Army service the Land Ceptor will replace the current Rapier air defense system and provides a step-change in capability, including over triple the range and the ability to intercept a much more challenging target set.

The system demonstration trial showcased the maturity of the Land Ceptor system across a full engagement sequence. This included launcher deployment; munition loading; receipt of air tracks from a Giraffe-AMB radar; air track processing by the Land Ceptor's onboard command and control (C2) system; and execution of a full engagement chain, with two-way data exchange with the missile during its mid-course fly-out phase, and successful interception and destruction of a target using the missile's seeker in the terminal phase.

Land Ceptor with CAMM is the latest generation of air defense system, providing exceptional capability from very short ranges (VSHORAD) below 1km into the medium range air defense (MRAD) tier beyond 25km. Key features of CAMM are its next generation solid-state active radar seeker, two-way data-link, low-signature rocket motor and its 360° soft-vertical launch system. These combine to enable the missile to rapidly intercept the most challenging and dangerous of threats including saturation attacks from precision guided munitions and maneuvering high-speed missiles emerging late from low altitude and from multiple directions simultaneously.

The demonstration in Vidsel coincides with the transition into production of the Land Ceptor weapon system, which will now undergo system-of-system integration and test as part of the British Army's Sky Sabre air defense architecture. It is the latest in a series of highly successful trials of CAMM and its related systems over several years that have consistently proven its maturity and game changing performance.

Royal Malaysian Navy Selects NSM for its Littoral Combat Ships

Norwegian company Kongsberg Defense & Aerospace AS (KONGSBERG) has entered into a contract worth Euro124 Million with the Royal Malaysian Navy for delivery of an undisclosed number of Naval Strike Missile (NSM) anti-ship missiles to their six new Littoral Combat Ships (LCSs)

Boustead Naval Shipyard (BNS) Sdn Bhd is building the 3,000 ton LCSs under a MYR9 Billion (US$2.1 Billion) contract awarded to BNS in July 2014. The first ship of the class, Maharaja Lela, was launched in August 2017. The LCS is based on Naval Group's Gowind 2500 Class corvette design.

The contract, which was signed at the Defense Services Asia 2018 (DSA 2018) exhibition in Kuala Lumpur, is a follow-on to the agreement announced 9 April 2015 for NSM shipboard equipment, said the company in a statement. The NSM will be deck mounted and integrated to the SETIS Combat Management System (CMS) provided by Naval Group.

"This contract provides the Royal Malaysian Navy with an important surface-to-surface-missile capability and confirms NSM's very strong position in the international market. NSM is currently chosen by Norway, Poland, Germany and Malaysia", says Eirik Lie, President of Kongsberg Defense & Aerospace AS.

Featuring the IIR seeker and inertial/GPS navigation the NSM is a 3.96m long missile able to strike both sea and land targets at a distance of around 100 nautical miles. The sub-sonic missile weighs 407kg and has a combined blast and fragmentation warhead weighing 120kg. The NSM is capable of reaching high subsonic speeds and can approach its targets in sea skim mode.

Schiebel And Airbus Helicopters Achieve Historic Manned Unmanned Teaming

In a groundbreaking demonstration on 17 April 2018, Schiebel's CAMCOPTER S-100 Unmanned Air System (UAS) and Airbus Helicopters' manned H145 successfully completed a series of Manned Unmanned Teaming (MUM-T) flights. Level 5 interoperability was achieved by providing the user onboard the manned aircraft with full command and control over the UAS and its payload, including launch and recovery.

The purpose of this pioneering demonstration, which took place as part of a technology partnership between the Austrian Armaments and Defense Technology Agency (ARWT) and Schiebel, was to explore the benefits and challenges of delivering MUM-T flight operations, especially those with highly valuable, mission-enhancing advantages for army aviation. As a true force-multiplier, MUM-T leverages the strengths of both manned and unmanned systems by providing pilots of manned aircraft with the ability to take full advantage of the Intelligence, Surveillance and Reconnaissance (ISR) capabilities of the UAS and thereby significantly improving safety and decision-making in complex, contested missions.

"This is a perfect example of Schiebel's commitment to staying at the cutting-edge of developments and capabilities," explained Hans Georg Schiebel, Chairman of the Schiebel Group.

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"The CAMCOPTER S-100 offers unsurpassed ISR capabilities and as such significantly enhances manned aircraft sensors, which is particularly valuable in complex operations and dangerous environments."

UAS are perfectly suited for providing an aerial overview, operating above manned assets whilst the manned assets benefit from using local terrain. This approach of enhancing coverage and timeliness of information while keeping pilots and manned assets safe enables commanders to maximize the advantages offered by both platforms.

"Manned UnManned Teaming multiplies the capabilities of both systems", said Mark R. Henning, Program Manager at Airbus Helicopters. "Smaller UAS with vertical takeoff and landing capabilities can, for example, fly around obstacles as trees or buildings closer than a helicopter could. They are able to explore unknown territory and deliver information to the helicopter crew which is operating from a safe position and then step in with the helicopter's superior effects having received a clear picture from the UAS."

"Another key advantage of such an approach is improved datalink security," explains Schiebel's Chief Technical Officer Chris Day. "The datalink between the manned and unmanned platform can be moved from a static to a dynamic environment, away from the ground, making it more robust and harder to detect."

Raytheon's 360-Degree AESA Radar Passes 3,000 Hours of Operation

Raytheon announced that its new radar, with 360-degree capability and gallium nitride-powered (GaN) AESA, which has been proposed to upgrade to Germany's Patriot Air and Missile Defense System, recently completed 3,000 hours of operation on April 25, 2018. The company-funded system is a key element of a joint Raytheon-Rheinmetall proposal to provide a full spectrum integrated air defense solution for the German Air Force (Luftwaffe).


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"The company-funded radar has demonstrated 360-degree capability, tracking tactical targets such as maneuvering fighter aircraft, simulated cruise and ballistic missiles, and drones," said Tom Laliberty, Raytheon Vice President of Integrated Air and Missile Defense for Raytheon's Integrated Defense Systems business at the ILA Berlin Air Show.

To prove 360-degree capability of the Raytheon-funded radar, a main AESA GaN antenna array worked with a second GaN-based AESA antenna that was pointed in a different direction. As targets flew out of one array's field of view and into another, the two arrays seamlessly passed information back and forth, continuously tracking — and providing quality fire control data — on multiple targets.

"It is clear that our partner Raytheon's radar has far surpassed the decades-old, 20th-century gallium arsenide radar technology being proposed by the MEADS development project," said Harald Mannheim, Rheinmetall's Senior Vice President and Head of Air Defense Programs Germany. "Raytheon's AESA GaN technology is capable, mature and ideally suited for the needs of the German Air Force."

Rheinmetall and Raytheon have a strategic teaming agreement, providing a full spectrum integrated air defense solution for the German Air Force.

"Our partner Raytheon is able to rapidly deliver this capability, ensuring that Germany will have the ability to defend its forces from threats in any direction, even, if required for the upcoming Baltic deployment in 2023 in support of NATO operations," Mannheim added.

The Raytheon-funded GaN-based AESA radar will work with the Integrated Air and Missile Defense Battle Command System and other open architectures. It maintains compatibility with the current Patriot Engagement Control Station and is full interoperability with NATO systems, such as the German SAMOC.

Airbus Helicopters Awarded US$389 Million in Contracts for 51 UH-72A Lakotas for the U.S. Army

Airbus Helicopters, Inc. received two contracts valued at approximately $389 Million ($273 + $116 Million) to deliver a total of 51 (35 +16) additional UH-72A Lakotas for the United States Army in March 2018. The contracts highlight the U.S. Army's confidence and growth capability of the Lakota program.

"We are proud of our partnership with the U.S. Army. As the world's best Helicopter Trainer provider, we recognize how important an asset the Lakota is for Army Aviation and our nation. Our employees at Airbus are committed to delivering every aircraft on-cost and on-schedule, without exception," said Chris EMERSON, President of Airbus Helicopters, Inc. and Head of the North America Region.

These new contracts include the UH-72A production aircraft, associated technical and flight operator manuals and program management. This procurement is broken into two configurations: 33 (17+16) UH-72A Lakotas for the Initial Entry Rotary Wing mission at Ft. Rucker and 18 UH-72A Lakotas for the Observer/Controller mission at the Army's Combat Training Centers. The aircraft provided under these contracts are from the 2016 fiscal year (FY) procurement decision.

Airbus builds the Lakota at its Columbus, Mississippi facility. Since the program inception in 2005, Airbus has delivered more than 423 Lakotas. The UH-72A is a twin-engine light utility helicopter used for a wide range of military operations including border patrol, MEDEVAC, troop and VIP transport, light cargo, Homeland Security.


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