DEFENCE TURKEY

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Under the auspices of the PRESIDENCY OF THE REPUBLIC OF TURKEY

- CONSIDERABLE INCREASE IN TURKEY'S 2018 BUDGET FOR DEFENSE
- 3RD INTERNATIONAL CYBER WARFARE AND SECURITY CONFERENCE WAS HELD IN ANKARA BY SSM
- SIMSOFT – TURKEY'S LEADER IN INNOVATIVE DEFENSE, SECURITY, MODELING & SIMULATION AND GAME TECHNOLOGIES
- LEONARDO DEMONSTRATES MISSION VERSATILITY AND PROWESS OF C-27J AIRCRAFT
- VITROCISET MOVING FORWARD WITH DETERMINED BUSINESS DEVELOPMENT IN TURKEY

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Aralık 2017

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In Pursuit of Increased Turkish Industry Contribution – FİGES Advances with Seasoned Staff and Engineering Expertise

In an exclusive Defence Turkey interview Mr. Koray Gökalp – General Manager of FİGES A.Ş discusses the company's substantial experience within many engineering disciplines coupled with their engineering culture to undertake such a project such as Powerpack. The company looks forward to similar projects in the future, ready to proudly serve the industry and the Republic of Turkey.

Defence Turkey: Mr. Gökalp, first of all thank you very much for your time. With its advanced engineering solutions and depth of field, FİGES A.Ş. is one of the leading engineering companies in Turkey. You have been offering high quality services to companies in various sectors in the field of computer aided engineering and system modeling. In addition, with the strategic decision you made in 2015, we see that you have become a company that invests, develops and produces high-tech products and aims to open up to the world market with these products. In this context, you have recently introduced new and distinctive technological products involving high technology such as MAST systems, 3D Metal Sintering Systems, Bionic Hand and Impedance Tubes. What would you like to say about your vision and roadmap that you have adopted?

FİGES has always been a well-known and trusted engineering company. Since 1990, we have provided computer-aided engineering services to a wide range of different customers operating on many different industries. However, when re-evaluating the company's mission statement and strategy in 2015, we have realized that to provide constant growth and a sustainable business model we needed to move from an operations-focused company to a customer-focused company. The actual need and pain of the customer is to have high-technology products at an affordable price. You can address that need by providing engineering services and let them figure out the rest, which only solves part of the issue, or you can provide them the end product, which is now a complete solution. Having that goal in mind, we have performed market research on different industries, talked to our customers and identified critical high technology products and technologies they need now or in the future. We have restructured the R&D organization in the company and tackled the products you have mentioned, namely MAST systems, 3D Metal Sintering Systems, Bionic Hand and Impedance Tubes. As of now, there are many other R&D projects and product ideas in FİGES with ongoing research, and the intention in all of these projects is to have a high technology, marketable product, targeting a certain need in the industry.

Defence Turkey: What would you like to say about your human resources structure, as a company having the related depth of field and which is one of the leading companies in Turkey in advanced technology with its strong engineers and academic advisers? What are the advantages of this strong staff in the R&D and Product Development phases?

As we are an engineering company, the total worth of FİGES is the sum of each of the individual staff members. Currently there are 10% Ph.D. degrees and more than 60% M.Sc. degrees in our engineering group, which is considerably above the industry standard. We work closely with the academic advisers both on R&D projects and for the thesis studies of our engineers. Contrary to common tendencies in the industry, we encourage our engineers to pursue higher education, and provide enough time and resources to them to have a balanced work-school life. We tend to hire successful and hardworking people, but also specifically look for creative and innovative thinking skills, as the distinctive feature of an R&D engineer is the ability to "think outside the box". In 2017, we have established a strong HR department with the strategy to decrease employee turnover, track and evaluate the career path of each individual employee, provide the necessary training and resources to them and inspire innovative thinking within the company.

Defence Turkey: Mr. Gökalp, you are aiming to create a corporate group where an investment company focusing on R&D is at the center and which is surrounded by separate companies established for each of your high-tech products. Within this context, what would you like to say about the advantages that your ongoing studies and the planned structure will bring to you both in domestic and foreign markets?

As the company grew through the years, many different service areas and engineering disciplines were included in its structure. The services we provide have spread to many clients from different industries. As the nature of the work involved advanced engineering customized for each client's needs, the type of work we did were all unique in each project. This model showed the clients that we can provide services in a vast breadth of application areas, but failed to highlight the depth of knowledge and experience we had in certain fields. Instead, we decided to focus our energy to develop products and services as separate entities or companies around FİGES' core, which is now basically an investment company that supports R&D focused initiatives. Each of these companies established around the core, will have their own products or their own specialized area of services. Hence from client's perspective, we will be able to emphasize that each of these companies are the best in class suppliers for that specific service or product. The purpose of the investment company at the center of this community is to first identify, together with entrepreneurs from within and outside the company, the strategic areas of service and the ideas for advanced technology products that are needed in different industries. This company will then develop and mature these ideas through R&D efforts, and then commercialize them within a sustainable corporate organization, in a manner similar to what was done with FİGES Technology Inc. Under this structure, entrepreneurs will

be able to benefit from FİGES' facilities, infrastructure and funding strength in every way, as they work to mature their ideas. Moreover, they will also own part of the rights pertaining to the product resulting from their ideas.

Defence Turkey: FİGES A.Ş. and Anova companies are planning to establish a joint venture to perform activities in the field of R&D software. Could you please inform us on the details of this initiative?

As you know, FİGES and Anova are the distributors of ANSYS family of products, which are top of the class engineering simulation software. We are merging the sales operations of each company under a new joint venture established in early 2018. The client will deal with a single company for all their ANSYS related needs and more importantly, they will be able to benefit from the combined technical knowledge and expertise of application engineers from both FİGES and Anova. All other operations including R&D and engineering will be separate as it was before, however we also have the intention to combine our engineering power for certain big projects like the Powerpack Development Project for the Altay MBT.

Defence Turkey: Do you have an inorganic growth strategy for foreign markets in the future, such as the acquisition of a technology-based company or establishment of a partnership with technological companies through joint production and development? Do you have any roadmap in the forthcoming period for the recognition and marketing of your high-tech products in foreign markets?

Turbo Machinery

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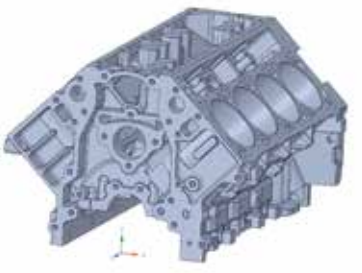
We do have the intention to acquire high-tech foreign companies in the future, as long as after the acquisition all the R&D operations of the acquired company will be carried over and performed in Turkey. We also plan to form a network of channel partners in the Middle East, Asia, Europe and U.S. for the marketing and sales of our own products.

Defence Turkey: Mr. Gökalp, FİGES A.Ş. is one of the companies that received RFP for the tender issued by SSM within the scope of the Powerpack Development Program. You emphasize that your company is able to develop unique and national powerpack with local resources without obtaining any technical consultancy package from abroad, and you underline that your company is assertive in this regard. What is your solution on this particular topic with your competencies and abilities in this field?

We have been involved in the Powerpack Development Program for the last 10 years. We have contacted and actually worked with many companies from all over the world, including manufacturers, suppliers, design offices, service providers, test centers and many others. The proposal we offered to SSM is the outcome of thousands and thousands of hours of work performed towards a conceptual design of the Powerpack. As you have mentioned, our solution is unique in the sense that all the development activities will be performed in Turkey without the need of a Technical Support Provider. We may work with certain experienced foreign individuals as a consultant during the development phase, but the scope of that consultancy will be much narrower than working with a Technical Support Provider. Therefore, we do not foresee any issue with an export license or government approval, as they will not be necessary. As for the critical sub-systems, separate project teams and suppliers will undertake development and test activities, as the Powerpack Project continues in parallel. We know that all the engineering disciplines and the engineering culture to undertake such a project is currently available in FİGES. However, we are also well aware that the human resources within FİGES will not be necessary to undertake such an important and big project. Hence, we have formed partnership with other R&D companies like Anova and BIAS, to perform design, analysis



Engine Block

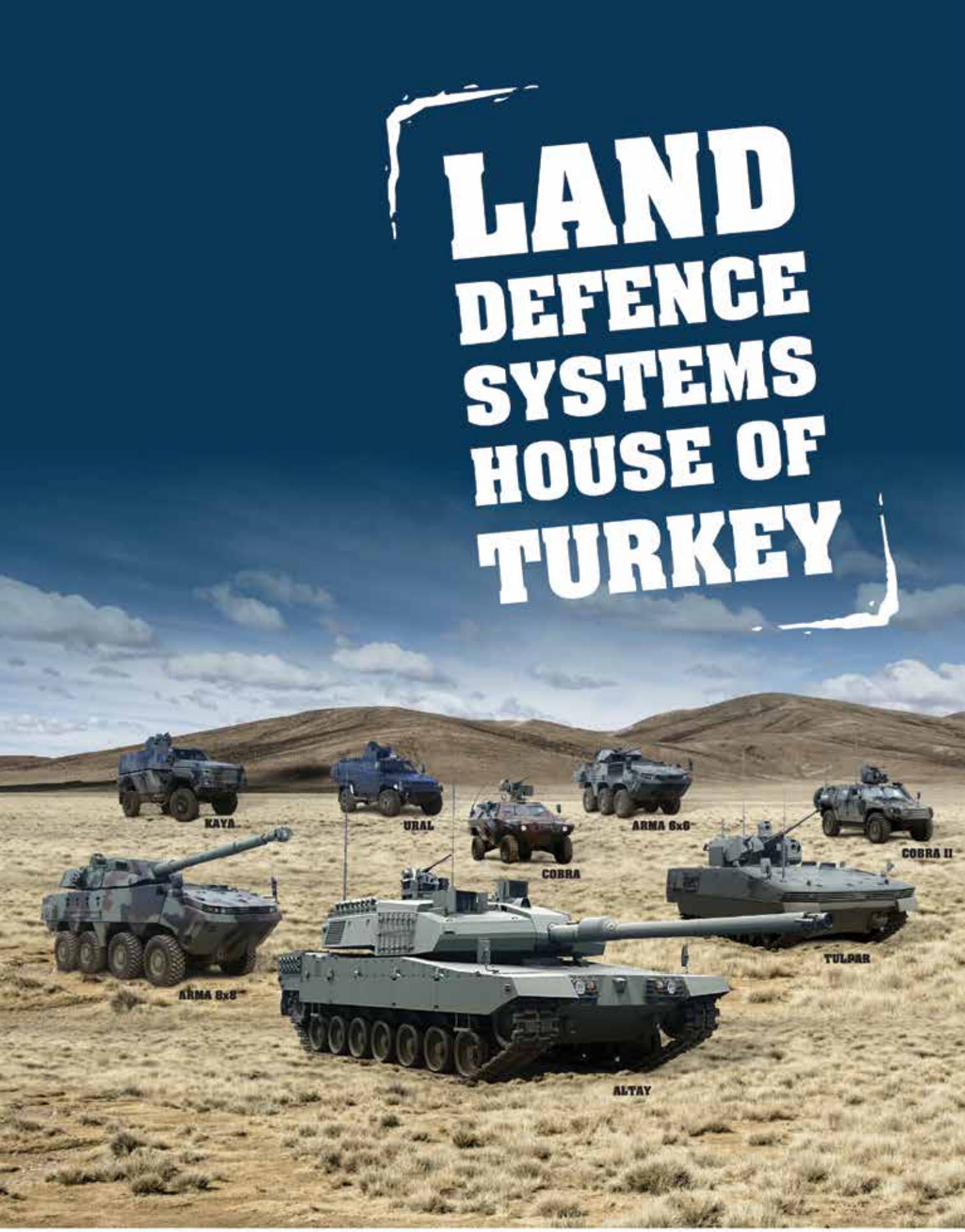
and test phases of the project. Manufacturing and assembly of the engine and transmission parts will be performed by well-known, highly capable manufacturing companies in Turkey.

Defence Turkey: Mr Gökalp, let's have a look at your new high-tech products. During the IDEF Fair, you unveiled your Telescopic Elevation Systems (MAST) of two different configurations (3m and 8m). These systems, developed and produced with national facilities, attracted considerable attention during the Fair. These systems, which can be integrated to all kinds of land and naval platforms, fixed platforms, antennas, sensors and radar systems, target detection devices, communication, reconnaissance and surveillance systems and weapons systems, can also be designed for the requirements of commercial communication companies. When you compare the systems provided from abroad as per the requirements of our country in the previous years, what kind of a product are we talking about in terms of capabilities, unique technologies, configurations, logistic support services and costs?

Our telescopic mast family of products and FİGES Technology as a company offer many advantages over its competitors. First, FİGES Technology has the R&D background of FİGES at its core. Therefore, in parallel to all the sales and mass production activities, we constantly improve our products and add models with different capabilities to our portfolio. Our main advantage is to be able to provide customer specific solutions when the requirements of the customer fall between the capabilities of our off-the-shelf mast systems. For example, the 3m MAST system we delivered to the South Korean company LIG Nex1 can be used in the extended position as the vehicle is travelling 80kmh on paved road and 40kmh on unpaved road. This feature adds tactical advantage to the vehicle during operation. In addition, our products tend to be lighter and having smaller footprint compared to other products on the market, due to extensive research we have done on the analysis, testing and optimization of carbon fiber composite lay-up. Especially for our domestic clients, we can provide quick and effective logistics and maintenance support in their facilities or in the field. We use about 90-95% domestic parts and suppliers for the entire system, which helps our domestic defense clients with their offset obligations. The only component where we cannot find a domestic supplier is for electronic connectors that comply with military standards. As we tend to use local suppliers, the cost of our product is currently positioned around 20%-30% below our competitors, without sacrificing from functionality, durability and quality.

FİGES Mast System Displayed the first time over the Nurol's NMS 4x4 at IDEF 2017

LAND DEFENCE SYSTEMS HOUSE OF TURKEY



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Defence Turkey: The MAST systems developed and produced in a short time like 8 months were still in the prototype stage during the IDEF Fair. What are the steps taken so far in order to achieve field and laboratory tests, and make them become a product in international standards? Could you please summarize the recent status?

Currently we have completed and passed almost all laboratory tests required to comply with MIL-STD standards, including vibration, shock, dust, sand, high temperature, low temperature, humidity, rain, icing, EMC. Solar radiation and low-pressure tests are ongoing and will be completed in January 2018. We have also performed rigorous mechanical and electrical functionality tests in our production facility. Currently, we are performing fatigue tests to ensure the product meets the durability requirements of our clients. These tests will also be completed at the end of January 2018. The strength and durability of the 3m MAST system we delivered to South Korea has been tested in the field by the end user in the United Arab Emirates, especially when the mast is in extended position and the vehicle is travelling, accelerating and braking. We are proud that the feedback from the customer was all positive and expressed their satisfaction from the outcome of these field tests.

Defence Turkey: Do you carry out studies on new generation versions that are 15 m and over and can carry more payloads, or which can be carried by a man portable configuration apart from these two configurations (3 m and 8 m) which were unveiled at IDEF Fair and can carry 150kg and 200 kg payloads? With 28 years of engineering experience, and with a staff that were able to introduce two configurations in a short time like 8 months, do you plan to introduce a new MAST family that can respond to the requirements of the world armies again in a short period of time? Do you have any news on this matter for the near future?

We are currently working on many different versions of telescopic masts. We have a 3m version with 300kg payload capacity, which we will deliver to Aselsan in the month of January. We have another 4m model with 300kg payload capacity; a 2.5m version for M60T Tanks, which has an entirely different extension-retraction mechanism; a steel frame version which can be retracted and folded on top of a trailer bed; and a 10m-15m model guided with wire ropes.

Defence Turkey: During the IDEF Fair, we know that you have received significant orders both in our country and abroad. In addition to the orders received from Aselsan's various sectoral directorates, you also made sales to the United Arab Emirates and South Korea. In this context, could you please inform us on the firm orders you have received so far, the financial volume of these orders, as well as the related offers you have submitted at the domestic and international tenders?

Currently, we have submitted 25 different offers to domestic and international customers. The volume of these proposals is around $30 Million, while the total value of the orders we have received is around $6 Million. We are waiting for another $3 Million purchase order from South Korea when they complete the tests on the prototype.

Defence Turkey: As a result of the orders received both from our country and abroad, you established a factory at the Başkent Organized Industry Zone. Are the studies for qualification of this factory's production line completed? What would you like to say about your future plans, with the annual production capacity planned within a short term?

We have made considerably investments to have a controlled and qualified production line. We have adopted an MRP and production planning process where we can track each individual part on the CAD model, from factory acceptance to the assembled system using unique IDs. Currently, in our production line we have 16 different stations for the assembly of one mast system. We measure the time spent on each of these stations to better optimize the production sequence and labor. Our current production capacity is around 30 masts in a month. Our goal is to reach 1000 masts produced and delivered by the end of 2020.

Defence Turkey: FİGES A.Ş. is conducting studies on 4th generation Generation Nuclear Power Plants. Could you please give some details on these studies?


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Our Nuclear Energy Technologies Division has expanded considerably during the last year. FİGES is actively involved in a European Union Project called Safety Assessment of the Molten Salt Fast Reactor, which is considered a 4th Generation Nuclear Power Plant. Our team is working on the development of first and second cycle heat exchangers as part of our scope within this project.

Defence Turkey: Could you please tell us about the studies you have been carrying out for the new generation technological products such as bionic hand and impedance tube?

We are lately working on haptic feedback technologies for our bionic hands. We are developing special sensors, which will improve the sense of touch and eventually bring the bionic hand technology closer to the human hand. Moreover, we are also working on scaling the bionic hand to provide solutions for children. Impedance tube systems are the fundamental tools for obtaining key parameters of acoustic materials. The system developed by acoustic experts within FİGES is efficiently utilized for commercial and internal R&D projects by not only FİGES but also its customers. We are also working on developing propulsion systems for marine applications and amphibious military vehicles, under our new division FİGES Marine.

Defence Turkey: Mr. Gökalp, where do you plan to position yourself within the next 10 years?

Our goal within the next 5-10 years is to develop and commercialize strategic and critical high-technology products and services for the domestic and international markets through individual subsidiary companies. We want to build the central R&D organization to be a hub where innovative ideas throughout the industry and academic institutions flow in and formed into an R&D project. We want FİGES to be a well-known brand associated with innovative thinking, and high-technology products that are ahead of the market trends. We will also continue to be involved in projects critical for our country. We have contributed to the development of MİLGEM National Ship and many others in the past. We have submitted a proposal to SSM for the development of Powerpack for the Altay Tank. There will also be many other projects, just like these, in the future where we would be proud and honored to undertake to serve the industry and our country.

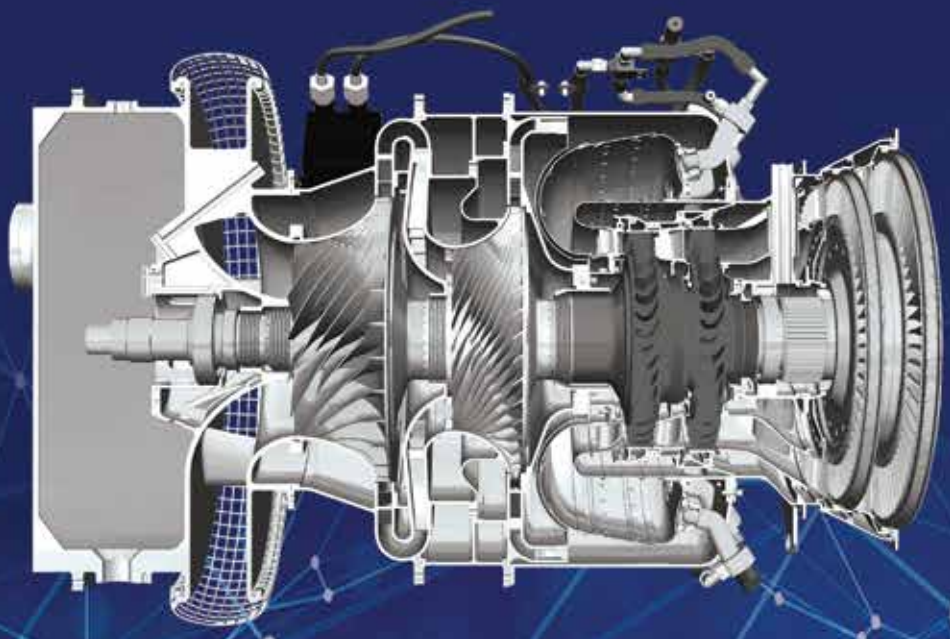
Bionic Hand

Defence Turkey: Do you have any messages that you would like to convey to Defence Turkey readers?

I would like to thank all the readers for their interest in our company. I invite them to our R&D Center, if they have innovative ideas but need to brainstorm and collaborate with other engineers, or if they need engineering resources and tools to transform their ideas into market-ready products

Mr. Koray Gökalp – General Manager of FİGES A.Ş; Mr. Cem Akalin – Managing Editor of Defence Turkey Magazine

TEI to Develop Turkey's First Indigenous Turboshaft Engine



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Considerable Increase in Turkey's 2018 Budget for Defense

The National Defense Ministry's and the Undersecretariat for Defense Industries' budget, final account and Court of Accounts reports were negotiated on 22th November with the participation of the Minister of National Defense Mr. Nurettin Canikli and commission members at the TBMM (Grand National Assembly of Turkey) Planning and Budget Commission. The Minister of National Defense relayed detailed information to the members of the commission on the Turkish Armed Forces' activities in 2017, delivered systems, latest status of the unique development programs and the S-400 Air Defense Missile System procurement program.

Stating that they aimed for a notable increase in the 2018 Defense Budget, Mr. Nurettin Canikli underlined that in the Wales Summit of 2014, putting forth a joint will, the presidents and heads of the governments of the NATO countries committed that 2% of the Gross Domestic Product would be allocated to defense expenditure and 20% of the defense expenses would be allocated to the defense industry's procurement programs. Mr. Canikli continued: "Independent from NATO's targets, due to the threats and challenges we have been experiencing, increasing our country's defense measures and modernization activities stand out as an immediate and compulsory necessity. Therefore, a significant increase in our defense budget is foreseen for 2018. The ratio of Turkey's defense expenditure to the gross domestic product was at the level of 1.47% in 2016. In 2017, this percentage was 1.46. Taking the budget plan for 2018 into consideration, increasing the level of this expenditure to 1.65% is envisaged." While replying to the questions from the commission members, Mr. Canikli particularly stressed that they aimed to increase the defense expenses to 2% by 2024.

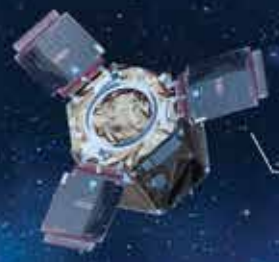
Minister of National Defense Mr. Nurettin Canikli: "The rate of Turkey's Main Weapon Systems to defense expenditure was 30.40% in 2017"

"According to the NATO Defense Planning Capability Survey, the rate of Turkey's main weapon systems expenditure to defense expenses were 25.59% in 2016 and this level is expected to increase to 30.40% in 2017. The necessity of increasing our defense expenditure arises from the requirement of achieving a stronger army through domestic and national equipment due to the risks and threats our country faces rather than the commitments made to NATO".

774 km of the Modular Concrete Wall Built at the Syrian Border Completed

Minister of National Defense Mr. Nurettin Canikli informed the commission members on the acquirements of the Euphrates Shield operation, measures taken and the latest status of the illegal entities in the region. Mr. Canikli: "We had to build additional physical blocks to the border in order to prevent the passage of terrorist entities at the Syrian border. Therefore, we started to implement a security project composed of barriers, surveillance and command control systems. The main components of the project are a concrete wall, watchtower, patrol road, reinforced trellis fence, lighting systems, active border troops, balloons, aerial and over-land observation with the UAVs and mobile armored vehicles, acoustic sensor, remote control weapon systems, laser weapon, automatic detection software and numerous other technological components. Moreover, we are building manned and unmanned towers to be integrated with surveillance and reconnaissance systems. The manned towers contain life units capable of fulfilling all requirements of our troops. Initially, we completed the construction of a 774-kilometer-long modular concrete wall as part of the 828 kilometers technically available for construction along the 911-kilometer-long Syrian border. The construction of the 54-kilometer-long modular concrete wall is being conducted in six different locations and presently 94% of the physical part has been completed. For maintaining the security of the Syrian border, the first phase as part of the Integrated Border Security System Project containing the installation of fiber optical detection system has been accomplished and the second phase will soon be finished. Besides, our activities for building a 144-kilometer-long border security system conducted by the Ministry of Interior within the same context at the Iraqi border are on course. Approximately 50-55 kilometers of this Project has been completed and we foresee the completion of the other components of the Project soon."

THE SKIES AND BEYOND



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S-400 Triumph Air Defense Missile System

Minister of National Defense Mr. Nurettin Canikli: "Turkey Made the First Advance Payment for the Procurement of the S-400 Air and Missile Defense Systems"

Stating that upon Turkey's written request to NATO in the beginning of 2013, Patriot and SAMP/T Air and Missile Defense System batteries were positioned in Adana and Kahramanmaraş, Mr. Canikli noted that these temporary solutions failed to suffice in fulfilling the air defense demands of the country and as a result of the assessments made in this context they adopted certain strategic decisions. Underlining that Turkey's urgent requirements in this area could not be left to the initiatives of other countries, Mr. Canikli added that a contract was signed with Russia for the procurement of S-400 air defense systems as a result of the long negotiations within this framework, that the first advance payment was made and the sales transaction as part of the procurement program was finalized.

Replying to the question from the commission members on how many systems were bought, Mr. Canikli stated that as part of the contract two S-400 Air and Missile Defense Systems (1 optional) would be procured and that the delivery of the first system was planned to be accomplished within 2019. Upon the questions from the commission members, Mr. Canikli added that 2 systems would be procured and that $2.5 billion would be paid. Mr. Canikli stressed that the systems would fully be under Turkey's control and that following this procurement the second phase covered joint development including the technology transfer.

Mr. Nurettin Canikli: "We wish to develop a more improved version of the SAMP/T system with Eurosam Consortium"

Emphasizing that Turkey would continue to develop its own unique systems in a determined fashion in addition to the systems to be procured through direct procurement method for fulfilling the immediate requests, Mr. Canikli continued: "We will continue to implement the decisions we adopted on developing our own unique systems without any concessions. We had signed the triple declaration of intention with French and Italian Defense Ministers who are the partners of the Eurosam consortium on 8th November 2017 in Brussels for fulfilling our air and missile defense system requirements through medium and long term technology transfer and joint production. With the aforesaid declaration of intention, we launched cooperation for identifying, developing, manufacturing and using the more improved version of SAMP/T system under the guidance of Eurosam with a consortium composed of Turkish, French and Italian companies. We wish to develop the systems we design in longer ranges after completing the aforementioned studies that are in initial phase."

Upon the question regarding which country Turkey would collaborate with when developing its own system, Minister of National Defense Mr. Canikli gave critical messages to the commission members and the public opinion. Mr. Canikli: "We had signed a contract with Eurosam for the joint development stage. Similarly, we are conducting separate negotiations with Russia for S-400 and with America for Patriot systems. They have not reached a certain level of maturity yet. If we manage to proceed in these negotiations, we will be conducting all these activities separately. We receive so many questions on which to choose. We will be conducting them altogether if necessary. There are a lot of reasons for that. If you

Eurosam SAMP/T Air and Missile Defense System

execute these long-term projects with a single company, then there will be moments you may fail to suffice as you are dependent on a single source in respect to both financial and technology transfer aspects. We experienced this in the past. In order to eliminate such risks, a will was put forth on executing these development activities separately with different countries and systems. If these processes continue to be realized with a single country, then the Project might cease at a certain stage of the Project or figures that may create high costs may arise. If there is a chance of executing this Project with another country or other countries, then as the dependence would be abolished it will be possible to finalize the Project successfully while keeping the costs under control. Even if the execution of the same subject through two or three channels might seem to increase the costs in the beginning, based on our past experiences we may claim that this method will guarantee us a more secure output heading towards success while decreasing the costs."

Russia Plans to Deliver the First System in March 2020

Not much detail was given on the procurement process, financing and the systems to be procured during Ministry of Defense Mr. Nurettin Canikli's statements at the Commission. However, a month later these statements, the Russian press asserted critical claims regarding the subject.

Speaking to Russian Kommersant journal on 27 December, President of the Russian Defense Company Rosteh Sergey Chemezov declared critical information on the systems to be procured and the process. Mr. Chemezov: "Turkey will be procuring four S-400 Air and Missile Defense System batteries and will be paying $2.5 billion for these systems. The negotiations on the loans to be granted to Turkey for the procurement of these batteries have been completed as well. Only the documents need to be verified for the time being. I may state that 45% of the contract would be paid in advance and the remaining 55% would be paid with the loan granted by Russia." Mr. Chemezov also added that they planned to conduct the delivery of the first S-400 to Turkey on March 2020. Only hours after this statement, Turkish party also made a statement on the finalization of the contract.

Minister Mr. Nurettin Canikli: "Hürkuş was armed as per the requirements of the Gendarmerie. We accomplished the delivery of the first jet and the test and integration activities for the second jet are on course, soon we will be delivering that as well".

Giving additional information to the commission members on the critical developments that took place in the defense industry in 2017, Mr. Canikli stated that the main objective of the defense industry was to turn Turkey into a global player in defense and security areas with unique design and high end technology capabilities.

Underlining that they endeavored to establish a national and domestic defense industry in line with the requirements of the Turkish Armed Forces, Mr. Canikli said that "Unless we own the critical technologies required for local and national systems then we would face certain difficulties and limitations in procuring such crucial technologies from abroad." Mr. Canikli noted that the "Fırtına" Howitzer system was sold to Saudi Arabia and Qatar, yet the sales of engine system utilized by this system could not be accomplished due to the restrictions set by Germany in the sale of the system to third parties and added, "The purchases to be made to Saudi Arabia was over $1 billion, in light of these experiences, instead of procuring and using the technology we aim to achieve its production and nationalization."

Enlightening the commission members on the latest status of the ongoing development and mass production programs in the Turkish Defense Industry, Mr. Canikli said, "The acceptance of the 2 prototype Basic Trainer Aircrafts as part of the Hürkuş-A Project has been accomplished. These prototypes were armed and we delivered the first aircraft to the Gendarmerie General Command for counter terrorism activities. 'Hürkuş' was designed fully as a training aircraft in the beginning but later it was armed for fulfilling Turkish Armed Forces' emerging immediate requirements. The test and integration stage of the second aircraft is about to be completed and we will be realizing its delivery within this year as well. Within the scope of Hürkuş-B Project, we will be fulfilling our Air Forces Command's Training Aircraft requirements. The production, system integration and ground tests of 15 aircrafts are on course to this end.

Turkey to Procure 27 more T129 "Atak" Helicopters in Addition to its Order of 59

Stating that "Atak" Helicopter was the most effective attack helicopter in its category according to global standards, Mr. Canikli noted that within the scope of the ongoing mass production program conducted within this scope, 25 T129 "Atak" helicopters were delivered to Land Forces Command (as of December 2017 this figure reached 27). Mr. Canikli added that as part of the program 61 more T129 "Atak" helicopters were to be delivered to the security forces. Mr. Canikli also stated that they launched the "Atak-2" Project for the development of a new "Atak" helicopter equipped with the most modern national systems and increased fuel and ammunition capacity with the target of achieving a fully unique design and production.

Minister Mr. Canikli also informed the commission members on the Turboshaft Engine Project currently under development and the Utility Helicopter Program. Mr. Canikli: "Through the Turboshaft Engine Project we aim to fulfill the requests of our national platforms. Within the scope of the Utility Helicopter Project, we will be conducting the production of 109 T-70 utility helicopters with our relevant Military and Police Units for covering the requirements of the General Directorate of Forestry. With the implemented Project model, we aim to achieve a local participation rate of 63% in the program. The delivery of the initial helicopter is expected to be realized in 2021 according to the program schedule."

The Number of Armed UAVs will Increase

Sharing the updated information on the procurement process of the national UAV systems with the commission members Mr. Canikli said, "In order to execute reconnaissance – surveillance, target and damage detection activities during the night and day in the requested critical regions, we started to include the "Bayraktar "TB2 Tactical UAV System in our military's inventory since 2015. Presently, these systems have the capabilities to neutralize the mobile and fixed targets with the help of mini smart ammunition. The rate of local participation achieved at this point reached 96% and this level makes us proud. To this end, procurement of a total of 151 UAVs is planned and 112 of them will be armed UAVs. For the time being, the delivery of 38 "Bayraktar" UAV systems has been completed and 15 of these systems are armed.

Similarly, our ANKA UAV systems designed and manufactured by TAI have successfully been executing their reconnaissance, surveillance,

Turkish UAV Systems equipped with MAM-L Munitions

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and target detection and tracking tasks. 40 platforms are planned to be procured as part of the Project and 25 of them will be armed platforms. Currently, the procurement of 5 “Anka” systems composed of 3 unarmed configurations and 2 armed UAVs completed and they were delivered. Our activities for the domestic development of UAV systems’ engines continue as well. The initial prototype of the engine was manufactured by TAI and the calibration and test activities are on their course. We aim to realize the acceptance of the prototype in December 2018.”

Making statements on the latest status of the national and unique marine programs, Mr. Canikli told the commission members that the TCG “Alemdar” vessel was delivered in January 2017 within the scope of Submarine Rescue Vessel Project and continued: “This vessel will be capable of conducting various essential tasks such as debris removal from 600 meter depth within maximum 72 hours, repairing, personnel rescuing and providing life support. Within the context of our other critical program the Amphibious Vessel Project, the provisional acceptance of our initial vessel LCS “Bayraktar” was realized on 14 April 2017 and the vessel was included in the inventory of Naval Forces Command. This vessel is capable of conducting firing and supported amphibious operation capabilities and carrying armored vehicles up to 120 tons. The second ship’s port reception tests were launched, and it is planned to be delivered to our Naval Forces Command by the end of the year.”

TCG F-511 “Heybeliada” MILGEM Corvette

Mr. Nurettin Canikli: “Pirireis - The first ship of the New Type Submarine Program will be launched to service in 2021”

Mr. Canikli: “Our activities as part of the MILGEM Project continues at pace. Our TCG ‘Heybeliada’ and TCG ‘Büyükada’ corvettes have been commissioned. The equipping of our third corvette TCG ‘Burgazada’, which we launched to sea last year, continues as well. We will have this corvette ready for operation in 2018 with all its equipment and weapon systems installed. The fourth ship of our Ada class MILGEM corvettes, TCG ‘Kınalıada’, will be availed to the service of our army in 2020 and its construction continues. The fifth vessel of the MILGEM Project composed of 8 fully uniquely designed ships, the Istanbul frigate’s initial welding was accomplished on July 3, 2017 with the participation of our Dear President. The block construction and slipway installation activities of this frigate are on their course.

Moreover, we launched the construction of 6 New Type Submarine Projects at Gölcük Shipyard Command. The construction of our initial vessel has been completed and its installation activities have been launched. We believe that these experiences we acquired will be a strong reference for the indigenous and national submarines aimed to be built as part of the unique submarine program (MILDEN).

We initiated the construction of the first vessel of the New Type Submarine Project, “Pirireis”, in 2015. The construction activities of ‘Hızırreis’ and ‘Muratreis’ submarines are ongoing. The welding of ‘Aydınreis’, ‘Seydalireis’ and ‘Selmanreis’ submarines will be conducted in the upcoming periods in twelve-month-periods. Our first submarine ‘Pirireis’ will be put into service in April 2021.”

250 thousand MPT-76s are Planned to be Manufactured by 2026

Providing information on the Modern Infantry Rifle MPT-76, which is the only rifle that passed all the tests conducted in line with the NATO standards, Mr. Canikli said, “As of now we have accomplished the delivery of 3.434 infantry rifles. 7 thousand rifles will be manufactured by the end of the year and a total of 250 thousand MPT-76s will be completed by 2026. We will be achieving the production of over 40 thousand rifles in 2018.”

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Mentioning that the tests of the Altay Project composed of the design, development, prototype production, test and qualification of the Modern Main Battle Tank through national resources were completed successfully, Mr. Canikli stated that they launched a tender for the mass production of 500 tanks (250 optional) and that the final proposals were submitted to the relevant authorities on November 2017. Mr. Canikli noted that after the evaluation of the proposals, they wished to conclude the tender process in the forthcoming days.

Mr. Canikli also noted that they successfully completed the delivery of the "Khan" missile which is a long range ground to ground missile system, and the firing test of which was achieved on 11 May 2017 in Sinop and the missile was successfully tested in a range of 280 km. Mr. Canikli added that they expected the acquirements achieved as part of this program would provide crucially to the other air defense missile systems.

Moreover, Mr. Canikli stated that guidance and pod capabilities were added to the present system of the "Kasırga" missile within the Turkish Armed Forces' inventory through the K+ project, extending the range of this system to 120 km. Underlining that Turkey had an essential competence considering 35 mm airburst ammunition, Mr. Canikli noted that they manufactured the aforesaid ammunition through national resources and continued: "This airburst ammunition will be one of the most crucial components of the new battle concept. Here, we are speaking of the ammunition capable of being effectively utilized by the naval, air and land troops and Turkey presently owns this technology. We are currently integrating these to our tanks damaged during the El Bab Operation, within the scope of the active protection system, with the help of this airburst ammunition the anti-tank systems will be destroyed in the air before they reach the tank. We completed the first phase."

The Artillery Missile "KHAN"

"MPT 76" Modern Infantry Rifle

Upon the completion of the briefing, the budget plan of the Ministry of National Defense for 2018 was submitted to the commission.

The 2018 Budget of the National Defense Ministry Expected to Reach 40.4 billion TL

According to the budget plan submitted to the commission by the Ministry of National Defense, the 2018 Budget for the Ministry is foreseen as 40 billion 402 million 238 thousand TL (est. $10.6 billion). Approximately 50 percent of the aforementioned budget, that is 20 billion 329 million TL (est. $5.34 billion), is expected to be composed of the goods and services procurement expenses including modernization projects. 13.8 billion TL (est. $3.63 billion) of this figure is planned to be allocated for the requirements as part of Turkey's Strategic Target Plan – 2018 Modernization Program. The remaining 6.5 billion TL is planned to be allocated to the Turkish Armed Forces' legal rights stipulated by the laws such as accommodation, nutrition, and clothing of the TAF's personnel in addition to the procurement of consumption goods and services such as fuel and transportation.

Apart from the Ministry of National Defense's yearly budget, there is also a Defense Industry Support Fund under the disposal of the Undersecretariat for Defense Industries, established for the modernization of the Turkish Armed Forces. This fund's budget for 2018 is expected to be 15 billion TL (est. $3.94 billion). Upon analysis of the breakdown of the fund revenues of 2018, this fund is expected to be composed of the tax revenues collected from 11.9 billion TL from income and corporate taxes, 291 million TL from inheritance and transfer taxes, 2.7 billon TL from motor vehicles tax.

It is possible to speak of a profit maximizer fund when the Defense Industry Support Fund's 2017 and past years balance of income and expenditures are analyzed. With this expectation, for 2018, in addition to the 15 billion TL expected from the taxes (est. $3.94 billion), with the surplus value of the past years, a fund income quite over this figure will be created.

According to the budget plan of year 2018, apart from the defense projects, a total fund of 66 million 11 thousand TL was allocated to the personnel expenses and management activities of the Undersecretariat for Defense Industries. 59.8 percent of this budget will be allocated to personnel expenses, 7.4 percent will be assigned to premium expenses to the social security institutions, 25.1 percent will be appointed to the payments for the procurement of goods and services, 2.7 percent will be allocated to current transfers and the remaining 5 percent will be allocated to capital expenses

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Projects Amounting to $5 Billion Determined at Defense Industry Executive Committee

A total of 22 clauses totaling an amount of $5 billion were concluded at the Defense Industry Executive Committee held on November 2nd, 2017 at SSM premises with the participation of Prime Minister Mr. Binali Yıldırım, Chief of General Staff Gen. Hulusi Akar, Mr. Nurettin Canikli - Minister of National Defense, Mr. Süleyman Soylu - Minister of Interior, Prof. İsmail Demir- Undersecretary for Defense Industries and the Undersecretariat officials.

No statement was made to the press about the topics discussed at the meeting which lasted 3.5 hours under the chairmanship of Prime Minister Mr. Binali Yildirim.

The following points were mentioned in the written statement made by the Undersecretariat for Defense Industries after the meeting:

"The Defense Industry Executive Committee gathered under the chairmanship of our Prime Minister in order to discuss the issues on the agenda and to make decisions about them. 22 projects valued at $5 billion were discussed at the meeting. The decisions were made by our committee for projects regarding the development of the National Long Range Air and Missile Defense Systems, projects for different types of missiles and


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smart ammunitions, electronic jamming and electronic warfare system projects, various caliber and size grenade launcher, rifle and pistol development and mass production projects, projects regarding naval platforms as well as missile and weapon systems that can be fired from naval platforms, projects for the modernization, development and additional mass production of combat and utility helicopters, projects for tank modernization and mass production, projects regarding the development of new and advanced versions of unmanned aerial vehicles and projects to increase their production capacity, projects for the construction of the MILGEM Class I frigate as well as the modernization, development and production of the Preveze class submarine."


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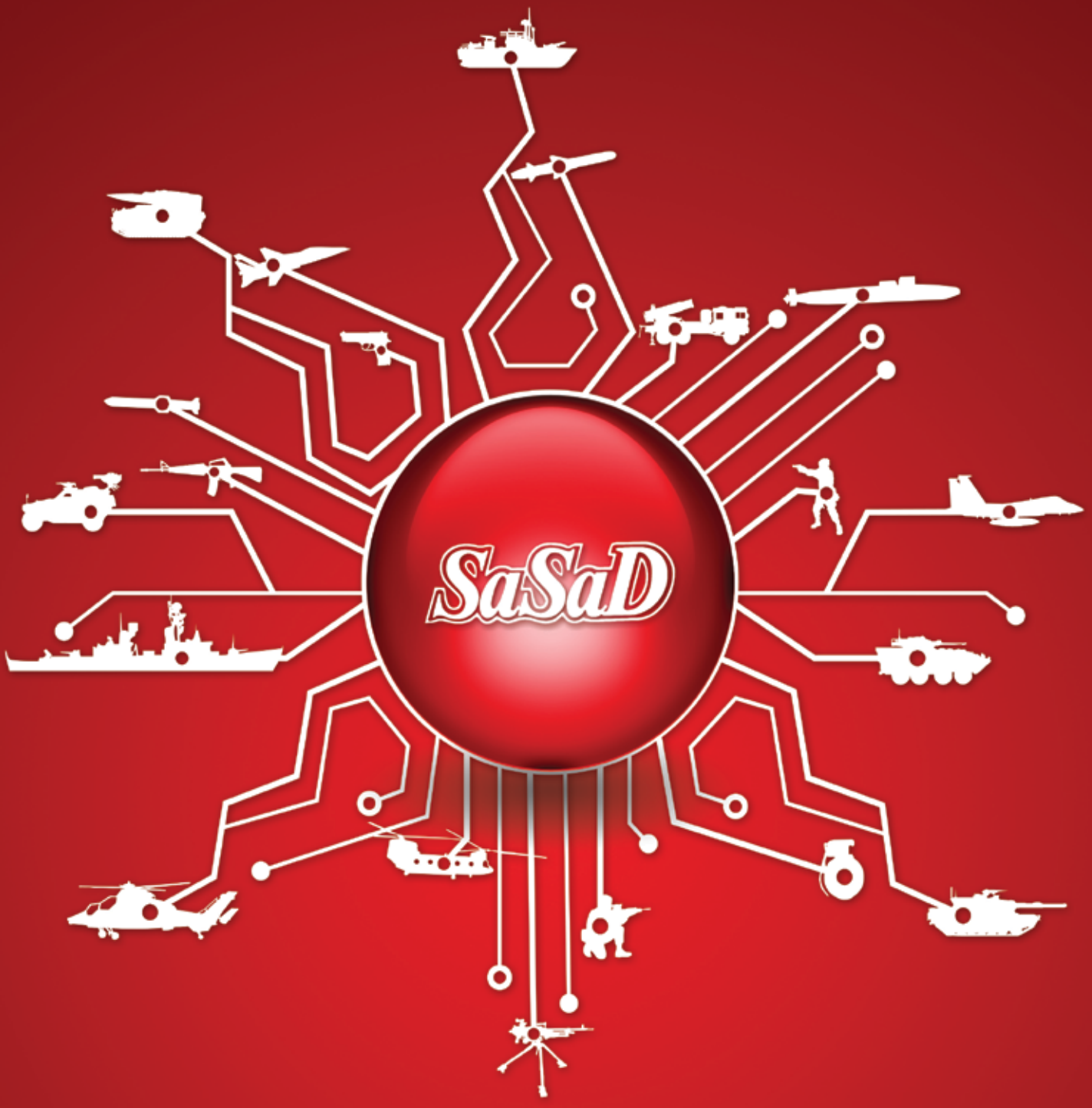

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Eurasia Air Show Draws Near – $40 Billion in Business Volume Expected

Anticipating 2018 to be the year of Aviation for Turkey, Mr. Ferhat Yenibertiz and his skilled team at the Eurasia Air Show Organization have been engaged in whetting the appetite of the Global Aviation Industry in preparation for Turkey's illustrious event. In an exclusive Defence Turkey interview CEO Mr. Ferhat Yenibertiz discusses details leading up to the event and expectations for the future

Defence Turkey: Dear Mr. Yenibertiz, first of all we would like to thank you for your time. At the end of 2016 we had a pleasant interview with you. At that time the stand and chalet sales of the organization had not yet been launched and the marketing, introduction and PR field studies were at the initial stages. What type of processes and related activities have taken place since then? Could you please summarize the current situation for us?

Since our last interview, we accomplished a "Road Show" in 11 countries from one end of the world to the other within a period of 12 months and we introduced the Eurasia Airshow which is one of the greatest aerospace organizations and explained our goals at appropriate platforms. In a sense, more than the Eurasia Airshow we mentioned our country, our aerospace potential, our accomplishments so far and Turkey's capabilities in this area. We presented critical data in order to attract them to our country.

Up to now, we have accomplished approximately 600 B2B (Business-to-Business) negotiations in our country and abroad and 80% of them have been conducted abroad. We have 12 representatives in charge of 54 countries around the world and I did not include the negotiations they attained in this figure. We can clearly claim that there is no one left in the world in the aerospace industry who has not yet heard of the Eurasia Airshow. Surely, at the end of the day, seeing results is quite important and we are currently working on reaping our harvest.

In addition to all of the promotion and marketing activities, we are conducting our preparations in flight, security, slot, parking, safety, construction, etc. mainly with Antalya Metropolitan Municipality, General Directorate of State Airports Operations (DHMI), General Directorate of Civil Aviation and all other relevant authorities. We are also in contact with the institutions and associations of the target countries with the support of the related embassies, commercial and military attachées. We endeavor to gain their support for the participation of delegations and national participation as well as the individual participation of major companies. As of this month, in accordance with our protocol with the DHMI, we will launch the installation activities at the area we allocated at the International Airport of Antalya.

Defence Turkey: Mr. Yenibertiz, the Eurasia Air Show will be taking place in Antalya on 25-29 April 2018 under the auspices of the Presidency and with the support of many ministries, institutions and associations. Which ministries, military and governmental institutions will be providing support to your organization within this framework? Could you please share your evaluations with us?

Under the auspices of the Presidency of the Republic of Turkey, Eurasia Airshow will be accomplished with the support of the Ministry of National Defense, Turkish Armed Forces, Ministry of Interior, Ministry of Transport, Maritime Affairs and Communications, Ministry of Economy, Ministry of Culture and Tourism, Ministry of Forestry and Water Affairs, Ministry of Health, Undersecretariat for Defense Industries, Undersecretariat of Ministry of National Defense, General Directorate of State Airports Operations, General Directorate of Civil Aviation, Governorship of Antalya, Antalya Metropolitan Municipality and Turkish Airlines.

Foreign companies wish to see governmental support in projects of such great scale. In this context, our government's belief in us and its support and the assignment of this qualified responsibility to us have all been a source of pride for us. Moreover, the participation of high end delegations is seen as one of the most critical success criteria of these types of fairs, and to this end, Undersecretarat for Defense Industries has extended an invitation letter to releated official authorities of a total of 42 countries. Besides, official invitations are being prepared by our National Defense Ministry to the Defense Ministries of the aforementioned number of countries. These official invitations have been sent to the civil authorities of numerous countries by the General Directorate of Civil Aviation under the Ministry of Transport, Maritime Affairs and Communication. This support provided by our governmental authorities is priceless and it empowers us in our negotiations with targeted countries.

Defence Turkey: Which domestic aerospace companies active in military and commercial areas will be attending the event and with which platforms, products and capabilities? Will we have the opportunity to see especially our national unique platforms and capabilities both at the static area and the flight demonstration area during the Air Show?

We pay ultimate attention to enable all our local companies active in aerospace areas, ranging from our major industry to sub industry to show their capabilities in the most effective way. We have companies with completed contracts or with contracts that are about to be completed. Our negotiations on the products to be displayed continue and we will be announcing them as they become finalized.

Defence Turkey: Activities have been conducted for a while now by KOSGEB (Small and Medium Industry Development Organization) and TOBB (Union of Chambers and Exchange Commodities) in order to provide support to the local companies that will be attending this event. Could you please inform us on the current status, the amount of the support to be provided and the scope of the support in respect to these companies?

In addition to the major players of the industry, we attach great importance to the participation of the Small and Medium Scaled

companies in the Eurasia Airshow and their demonstration of capabilities. Having said that, in order to enable our companies to introduce themselves to the world and extend their business volume through new contracts, we applied to the domestic event support of KOSGEB and our event has been included in this scope.

If the Small and Medium Scaled companies achieve the required criteria, the stand areas of a total of 1,250 square meters will be supported by KOSGEB and within the scope of this support, our companies deemed suitable will be able to take part at this area. Our minimum support area for the companies achieving the required support criteria will be 50 square meters and the final application date was identified as 18 April 2018.

Moreover, we have gained the support of the Procurement Committee of the Ministry of Economy. With this support, a government supported negotiation will be achieved by inviting our companies with products of export potential and the purchaser and decision makers abroad to the Eurasia Airshow. In addition, the Eurasia Airshow has arranged its part within the event schedule of TOBB for 2018.

Defence Turkey: Mr. Yenibertiz, local and foreign subcontractors and main contractors active in aviation/ aerospace and space fields will be gathering at this event. One of the areas drawing significant interest is curiosity about the attendance details of international delegations, the activities conducted by the Ministry of National Defense and the Undersecretariat for Defense Industries. What would you like to share regarding these topics, as well as details about confirmed participation of official delegations?

The Eurasia Airshow gathers global and regional players of the sector active in commercial and military aerospace industry. We will be bringing together

Turkey's capabilities and powers with the whole aviation aerospace ecosystem; from the airlines companies to engine manufacturers, from parts suppliers to cargo supply chain, the shareholders of the industry related with the military platforms, certification systems, airport projects and airport management.

I can say that no matter how important it is to gather these players of the aerospace industry, just as in the defense industry, the existence of the governmental representatives and decision makers in this organization is also amongst the most critical criteria. In order to actualize such official visits, the official invitations need to be summoned to relevant authorities. To this end, invitation letters are being sent to worldwide counterparts with the precious support of the Ministry of National Defense, Undersecretariat for Defense Industries, General Directorate of Civil Aviation and Turkish Airlines.

The replies to the aforementioned official invitations are being officially collected by the Ministry of Foreign Affairs and we have received the most rapid replies from Thailand, Algeria and the United Kingdom. We aim to have all of the replies collected by the end of February. We expect the participation of 100 - 150 VIP delegations from at least thirty countries.

Defence Turkey: One of the most significant brands of our country, Turkish Airlines, has become the main partner of the Eurasia Airshow. Within the context of the Turkish Airlines CEO summit, a special summit in which the CEOs of the Star Alliance member International Airlines is expected to participate, it will be held as part of this organization. What type of an organization is being planned within the scope of the THY CEO Summit?

As Turkish Airlines is the Main Partner of the Eurasia Airshow, and our country's brand value is a source of pride for us, at the same time it assigns a critical responsibility to our organization.

We plan to achieve a breakthrough at the Eurasia Airshow. We are inviting the CEO's of 27 Star Alliance member airline companies to the "Turkish Airlines Airlines' CEO Summit" at the Eurasia Airshow with the support of Turkish Airlines. This summit, in which the topics such as world's developing airway networks, the 3rd airport of which the first section is planned to be launched this September in Istanbul, and the future of airline transport, will be examined and it is of great importance for the airline companies and suppliers and we are very excited about this.

In addition to the "Airlines' CEO Summit", we are organizing a Golf Tournament with Turkish Airlines partnership and we will benefit from the vast experience of Turkish Airlines in this area. As you know, the aerospace industry network is highly interrelated

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with golf and Antalya owns one of the world's most beautiful golf courses and hotels. Thus, the Eurasia Airshow will bring together these three components.

Defence Turkey: Russia's crucial Military and Civilian aircraft manufacturer Sukhoi Company will be one of the companies to demonstrate its air vehicles at the Eurasia Air Show. Which air platforms are planned to be displayed at the static area in this context? Moreover, will we witness flight demonstrations of Sukhoi air platforms throughout the event?

Sukoi Company is one of the giant worldwide companies with headquarters in Russia and, for the first time, they will participate at such a large scale in respect to both the platform and event participation in Turkey. 10 military & civil air platforms and one Supersonic Business Jet project are being conducted within the auspices of Sukhoi.

Within the scope of this fair, the companies are deciding on which products to display after running certain operational evaluations. The air platforms to be demonstrated by Sukhoi is still a surprise, yet our expectation and our attempts proceed in the direction of SU-80 and SU-100. We will absolutely share the final decision of the company's representatives with you.

Defence Turkey: In addition to aviation and space global giants such as Sukhoi, which international aerospace giants, that are active at in manufacturing military aviation & space, civilian and commercial aircrafts and business jets, will be attending the event at the chalet level? Could you please update us on confirmed and ongoing negotiations?

At the Eurasia Airshow, we will not only demonstrate our capabilities in aviation but also aim to put Turkey's importance in this region into forefront.

With the new airport built in Istanbul, the world is aware that Turkey will become a HUB in this region particularly considering

cargo transportation and they have been investing in this direction as well.

When this new airport is launched in Istanbul, it will have a cargo capacity of 2.5 million tons. Hong Kong, with its 4.5 million tons of cargo movements remains the leader in this area. When all its phases are completed, Istanbul's new airport will bear 5.5 million tons of cargo capacity. At the initial stage it will have the capacity for 90 thousand passengers and when the project is entirely completed it will be providing services to 200 million passengers.

A space allocation agreement valued at approximately €250 million has been signed with merely 6 companies for the Cargo and Ground Services Campus. On the other hand, Turkish Airlines expressed its intention of placing an order of 25 Airbus 350-900 aircrafts and 20+20 Boeing 737-900 Dreamliners.

In light of all these developments, all major players attending the Eurasia Air Show will seize the opportunity of closely observing Turkey's goals and development as well.

We are about to shake hands with world giants such as Airbus, Antonov, Boeing, Honeywell, BAE Systems, Bell Helicopters, Dassault, GA Telesis, GE Aviation, Raytheon, Rockwell Collins, Rolls Royce, Rosoboronexport, Sukhoi, Thales and Lockheed Martin. During all our negotiations with the aforementioned companies,

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we are intensely working on building scenarios and rationally defining why they need to take part in this event by studying all the existing and potential business opportunities in the region, Turkey being in the first place.

Defence Turkey: Which type of a participation rate do you anticipate when you analyze the participation of the aerospace companies active in the defense industry, commercial aircrafts and business jets manufacturers and the commercial airline companies in the fair? In our former interview, you mentioned that 60% of total participation is planned from abroad and 40% of it would be composed of companies from our country. Could you evaluate the current status for our magazine?

In organizing Eurasia Airshow, our main objective is to show the potential of Turkey and its region in aviation to the world. European and American manufacturers and participants easily reach and meet each other at any of the events in the world. At this point, we plan to make the Eurasia Airshow a business development platform beyond a fair that gathers west and east. To this end, our initiations continue in a total of 54 countries with our representations. We can say that the current status proceeds according to this figure.

Defence Turkey: One of the points of interest is the platforms to be displayed at the static area. In order to increase commercial business volume, commercial aircrafts and business jets absolutely need more display exposure at air shows. These events offer critical opportunities for countries to demonstrate their military capabilities and technologies as well as a chance to reveal new generation platforms. Within this context, what kind of an arrangement can we expect to see for the static area?

Surely, the static display areas are amongst the most critical points, the heartlands of the aviation events. As you know, the air platforms to be displayed at these static areas are not finalized until the very last moment, various changes may occur due to deciding on which aircrafts are to be expected on the ground on those dates, operational plans, etc. We have a team composed of 11 colleagues merely working on this side of the operation.

Air platforms in various scales will remain at the static display area. Moreover, we have been exerting great efforts in order to position the aircrafts and jets standing out with their characteristics concerning size, model, etc. I may claim that displaying the following aircrafts and jets is among our greatest objectives; for instance AN-225, AN-170, AN-148 from Antonov series, 778, 777 and 737s from the Boeing family, the A 400 M, A-380, A-350,A-330, A-320 from the Airbus family, the SU-80 and SU-100 from the Sukhoi series as well as we are eager to host the F-35 JSF at the static display area. During the fair, we also plan some surprises, such as aircrafts with striking coatings.

Defence Turkey: One of the most crucial and part of the Airshows is "flight management". What type of planning is occurring regarding this integral aspect of the event? Could you please elaborate on the team that has been created for flight management and also share details about the preparation process?

When we decided to hold the Eurasia Airshow, in order to successfully accomplish the one of Air Show's most critical processes, the "Flight Management" stage, we got in touch with certain groups from United Kingdom and France that have been achieving flight management for centuries. We learned a lot from them throughout this process. However, it was very obvious that we also needed a local team that will be able to share the same feelings with us while accomplishing such a grand air show in our country. Thus, we became familiar with OTAKU aviation during this process.

Within our Flight Management team, we have an expanding team of 11 staff who are only concentrating on this process. In addition to the execution of foreign correspondence, this team has been working diligently on editing the flight demonstrations from scratch which will be realized throughout five days, with time & slot adjustments, the NOTAM processing with the air navigation department at the DHMI and the safety of parking position, etc. We can regard Flight Management itself as a production. In this process, we are receiving consultancy from the Irish Perttu Karivalo (Flying Display Director) with a great reputation in this area having worked in major aviation events for years as well.

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Defence Turkey: Without doubt, when the term Air Show is mentioned, flight demonstrations, demonstration teams, military aircrafts and helicopters immediately come to mind. Could you please inform us about the confirmed flight demonstrations and also share a bit about the ongoing negotiations to this end?

Realizing an Air Show concept in Turkey through the Eurasia Airshow is our greatest target, actualizing a fair at a location is not a very difficult thing to achieve but when you intend to do it in the air, you initially need to take care of the safety issues. At this point, I am envisioning five days for developing particularly the youth's perspective of aviation and enabling them to experience an atmosphere where they will be able to touch the aircrafts and jets which they would not be able to see beyond the internet, while building a process in which they may decide to be involved in this industry with high added value.

Hereby, I would also like to state that within this context, invitation preparations for reaching the youth in the relevant institutions and associations are being held over the Ministry of Education to the Governorships of 81 cities in Turkey.

Our written correspondence with the 7-8 countries which we plan flight demonstrations continue as well, they all have certain schedules and we work on taking part in these schedules.

If we group these teams;

Solo Propeller; Air Benders, Artur Kielak, Dario Costa

Civil team; Pioneer Team;

Historical aircraft; Bronco Demo Team from Belgium

As wing walker which we believe will be creating tremendous impression the Aerobatic Tactics; our pride concerning the military flight teams the Turkish Stars, Frecce Tricolori from Italy, Krila Oluje from Croatia, Red Arrows from United Kingdom and Al Fursan from the United Arab Emirates,

Regarding Military Solo Jets once again with our source of pride SoloTürk our negotiations on inviting MIG-29 jet from Poland, Gripen from the Czech Repubic, Su-35 from Russia, Eurofighter from the United Kingdom and F35 JSF from Italy to the flight demonstrations continue with the parties.

"Turkish Stars" - Aerobatic Demonstration Team of the Turkish Air Force

Besides, not only these breathtaking flight demonstrations exist in our schedules, we also wish to make an organization in which the fans will seize the opportunity to meet the pilots and teams.

Defence Turkey: There will be an attempt to set a record at the Eurasia Air Show that we have rarely experienced during former airshows. Could you please touch on the Wingsuit World Record Attempt project?

The Eurasia Airshow will be the first in Turkey while also being the center of breakthroughs in Turkey as well.

We plan to break five world records throughout the event. Cengiz Koçak from the Turkish Air Sports Federation is a brave friend of mine full of quite interesting ideas and I would very much like you to meet him at the Eurasia Airshow. He provided me with details about this project as soon as he heard of the Eurasia Airshow and we gladly embraced his project.

Within the scope of the Eurasia Airshow Wingsuits World Record Project, we aim to set the first record through performing a jump out of the aircraft at 40,000 feet of altitude with the wingsuit and at this stage we are expected to be break the second world record by covering over 30 km distance of horizontal range in under 571 seconds. Moreover, we aim to add a bit of show in the plan. Throughout this demonstration a SoloTürk will accompany Cengiz Koçak. Without doubt a risk plan is required for this and it will be built and required permits will be acquired. We are currently working on them.

Our other record will be performing a live concert in an aircraft at the highest altitude. Oğuz Sırmalı is well recognized and popular name in the aviation industry. He also has a video clip with the Turkish Stars team as well as a flight-minded skilled tenor. We are planning to give an exclusive concert in-flight over the 42,000 feet, we will be simultaneously breaking the world records of live concert, audio recording and video recording.

The idea of the pride and joy that we will undoubtedly experience while watching these performances from giant screens as these records are being set already excites us.

Defence Turkey: As the Eurasia Air Show will be taking place in Antalya, which is the center of tourism and entertainment, surely fun activities and different organizations will also play an active role. Within this context, you've planned an international golf tournament and a magnificent concert where world-famous stars will be attending. What are the recent developments on this?

The Turkish Airlines Golf Tournament is currently under the approval stage of the Board of Turkish Airlines. We will be announcing it as soon as it is signed. We have in our program the intent to bring a world class star to Turkey, but of course such people have certain tour schedules and we continue working on the artists who would be around this region in April.

Defence Turkey: Mr. Yenibertiz, what are your expectations for commercial business volume resulting from this organization? In addition, could you please discuss your vision for the upcoming period in this regard?

As the Eurasia Airshow, we are accomplishing the greatest organization of the history of our Republic, in respect to the added value which will be provided to our country. Taking into consideration the contracts to be signed in commercial and military aerospace industry, potential aircraft procurements and aircraft orders throughout the event and during the year, in addition to the financial contribution to our country via the accommodation and transportation expenses of thousands of foreign visitors and their social activities, we aim for the Eurasia Airshow to achieve a business volume of $40 billion. We will be gathering the worldwide major players of the aerospace industry.

Defence Turkey: Finally, would you like to convey any messages to the readers of Defence Turkey?

I hope that the people of this country, especially the decision makers and the major brands in the aerospace industry would grasp the main goal of this project and proceed accordingly. This project has reached such a point that it became the project of the country instead of an individual's project. Therefore, one has to exert effort and spend money in order to achieve a grand project. Why do we collaborate with major agencies, why did we allocate such a great budget or why do we endeavor to use all the channels of social media? These aspects are essential toward expanding the awareness. They are achieving such extraordinary things and the foreigners find all the institutional and creative image activities quite elegant. They express that we are well prepared, the objectives have been defined well and that they believed in us and trust us. Hearing such things from foreigners is great. Within the same context, I wish that all the institutions and individuals in Turkey become a representative, a narrator of the Eurasia Airshow as it is not merely my project; instead we are tools and representatives for the execution of this project. At the end of the day, our country will be gaining from this achievement. We perceive this organization just as 'business' yet it is a quite effective factor in respect to increasing our country's recognition. The Ministry of Culture and Tourism and Antalya's local administration are quite aware of this and they are giving us maximum support.

Bronco Demo Team from Belgium

We are creating Turkey's second global brand after Turkish Airlines in the aerospace industry. We imagine reaching a point where people would wear caps and t-shirts with the Eurasia Airshow logo and an organization to which people would look forward to, eager for the next event. You cannot imagine the quantity of e-mails and messages sent from volunteers all over Turkey. Currently we are signing one of the greatest signatures for the future of the aerospace industry in our country. At this point, without a doubt the feedback, experiences and criticism from you and your approach of "Would it be better if we do it in this way?" will be essential for us. Surely, we strive to achieve the best; still we are open to all types of criticism as well.

I would like to express that with the Eurasia Airshow and the launch of Istanbul's New Airport, 2018 will be the year of aviation for Turkey

Airbenders Aerobatic Team Pilot Oğuzhan Yararcan

3rd International Cyber Warfare and Security Conference was Held in Ankara by SSM

The main theme of conference was "Strengthening the Cyber Security Ecosystem and Cyber Security Cluster"

The 3rd annual Cyber Warfare & Security Conference was held in Ankara, on November 27-28, 2017 under the auspices of the Undersecretariat for Defense Industries; supported by the Prime Ministry, the Ministry of Transport, Maritime Affairs and Communications, the Ministry of Science and Technology, the Ministry of Development, Information Technologies and Communication Authority, TÜBITAK and SaSaD, and organized by Defence Turkey Magazine.

The presentations were based on the 2017 Theme: "Strengthening the Cyber Security Ecosystem and Cyber Security Cluster", "Increasing Competitiveness and Development", with the participation of approximately 400 guests consisting of public, institutional and private sector representatives and senior officials.

Opening speeches for the two-day conference were presented by Vice President of Information Technology Institute Mr. Ahmet Kılıç, Deputy Undersecretary of Defense Industries Mr. Mustafa Şeker and Keynote speaker, Director of NATO Infrastructure Services, Dr. Gregory B. Edwards.

Mr. Mustafa Şeker, Deputy Undersecretary of Defense Industries, emphasized that cyber security is a very large area and that they will focus on the issue of clustering during this conference. "We want to create a clear road map at the end of the day, we aim to use the resources efficiently. The Turkish Armed Forces, public institutions and organizations have an increased awareness, but our competence is not yet at the desired level. A task has been given to us in order to increase the competencies of our local companies and to establish the ecosystem within the frame of the action plan that we have created. In this context, we will discuss the support we provide to our entrepreneurs today. We are willing to create a targeted cluster of exports, focused on technology and innovation, and that the products can be collected under one roof and made internationally marketable."

Mr. Mustafa Şeker - Deputy Undersecretary of Defense Industries

Mr. Ahmet Kılıç, Vice President of Information Technologies and Communication Authority (BTK), noted that the operations carried out from internet connected devices and the data produced are constantly increasing, and that cyber security has become a part of national security due to the risks of social and economic life. "The attacks cost more than $500 billion per year for cyberattacks, making attacks by cyber attackers easier with today's technology, while the costs of protecting these against these daunting threats are increasing for nations and individual users." He emphasized that cyberattacks will continue to increase and detection will become more difficult, and that new and up-to-date methods must be explored and used to defend them.

Keynote Speaker- NATO Infrastructure Services Director, Gregory B. Edwards: "NATO Cybersecurity – A Look Beyond the Horizon"

The following the opening speeches, the Keynote Speaker-Dr. Gregory B. Edwards, Director Infrastructure Services, NATO, NCI Agency pointed out the agency's contributions in cyber security for NATO. He noted that "Turkey understands that the threat is real and is involved and engaged as a nation, and as a military. I'm encouraged by that as I begin my presentation, talking about our contributions from an agency prospective to NATO. We think it's important that we look beyond the horizon. Again, the threats are real. We have defenses in place today. We have capabilities in place today. But, in cyber security you are always thinking about the next step, being proactive in where we are headed." Dr. Gregory B. Edwards elaborated on NATO's mission of 'Connecting the Force' via the digital platform and the capabilities that they will modernize, resulting in cohesive services in NATO.

Dr. Gregory B. Edwards provided insight into the reduction of Cyber Attack Surface through Data Center Consolidation. He shared "IT modernization is a fundamental capability that is talked about in NATO, as to how we will modernize the infrastructure we're putting in place. There's a contract in place allowing

us to do that. Simply, what we are doing is reducing the attack surface. We have too many computers, too many nodes, too many servers that are deployed throughout NATO as an enterprise, we want to reduce that. We want to consolidate those into a data center, because we feel that there we can better protect and defend that particular environment from our applications to the core services that we provide. Another way to look at this is in terms of the common infrastructure in cyber security and operations. We are modernizing our roadmap, and we ask you, as a nation, industry, as academia to work with us to modernize and improve where we are headed."

Dr. Gregory B. Edwards continued "We are increasing our ability to defend ourselves. We as an agency provide technical solution services to NATO that are necessary to defend NATO's cyber enterprise. They extend all the way from helping to develop policy that is triggered on cyber defense, all the way to the extent of defense training. We think that these are the key services in NATO that are necessary to take us into the future for cyber defense. As we talk about raising the bar, what can we do to improve policy and strategy? Be more prescriptive. This is a very important point for us in that policy dictates what you are able to do. If you wait for the policy in cyber defense you could be at a disadvantage, you could be late in defending yourself in that regard. What we are suggesting is that policies be more incremental. Develop a policy that allows you respond to threats. You cannot wait for the policy to be developed and then respond. Let's be more prescriptive. Also, our financial capabilities are limited. We are not going to buy everything that industry has to offer and employ that, it would be a foolish endeavor. What we are suggesting is that nations, Turkey, others, you have developed capabilities. Let us learn what those capabilities are and let us take advantage of those capabilities for NATO. It's no different than what we do today from an air, land and maritime environment. Let's do the same in cyber."

Integrating Network Operations and Defense

Dr. Gregory B. Edwards commented that "The people who watch your network day to day, looking for problems that are performance related, are the same people who look at your network and notice that there is a cyberattack, a cyber threat on your network. We are suggesting that those must always be intertwined, they must always stay together. If you separate them, you open yourself for a vulnerability that the enemy would love to exploit. The day to day watchers of the management of the network are the same individuals who are the cyber defenders of your network, and our suggestion is to keep them together. When there is discussion about adaptations and changes within NATO, this is the Professional advice, as subject matter leaders, that we give to leaders in that regard."

Dr. Gregory B. Edwards, Director Infrastructure Services, NATO, NCI Agency

Compliance and Audit

NATO has teams who deploy and go into inspect the cyber environment. In that cyber environment, they identify what the problems are. Dr. Gregory B. Edwards underlined that there is shift now, they will go in and inspect and then fix what those problems are because there are threats that are being left and have to be taken care of. He said "In the past this team would deploy and again it would look at any nation's environment that it was authorized to access and then give you a report. We are going to change this to where we are able to then stay with you and actually fix problems that are in your environment. A chain is only as strong as its weakest link. We want a strong chain in this area." He continued saying "Again, it really is also about people. It is really not just about technology. It is about us. Those people have to be trained, nurtured and supported in this cyber environment. We must invest in our human capital, the people, the brains are what we use to take us forward. We say develop cyber warriors; we must be aware of an aspect of cyber that is about defense and how it is deployed."

Cyber Hygiene – Internal Threat is Real

The term cyber hygiene was discussed. Dr. Gregory B. Edwards expressed that it is essential to thoroughly address known threats, an internal look, making sure all servers, software current versions and patches are in place. He noted that "Many in the cyber world have noticed that we have had an external focus. An external focus is important, but we're fairly well defended in that area. There are many threats that arise from mistakes that we make inside and vulnerabilities that we know of."

Leveraging National Solutions

Nations have come together to provide capabilities to NATO. Dr. Gregory B. Edwards stated "We worked with these nations under various programs to find where the capabilities can contribute directly to solving key problems in NATO. Cyber situational awareness is a key problem that we are focused on today. It is one that was brought to us by a group of nations. We implore the nations, bring us your capabilities so that we can use them to contribute to the defense of NATO." The IT modernization Project is a large one that will allow NATO to consolidate a lot of the external servers and devices that they have throughout their enterprise into a more centralized managed environment, one that they can better defend. Dr. Gregory B. Edwards shared "When you develop the architecture for your enterprise we think it is important that you think about cyber security, that's the beginning step. We'll extend ourselves into the deployable space where nations contribute forces to execute missions for NATO providing mission assurance. This is our focus." Dr. Gregory B. Edwards shared how the agency is moving forward in developing a digital platform and how they are posturing themselves to be able to defend that digital platform as modernization occurs. Specifically, NATO is imploring support from industry, nations and academia in order be able to move forward in their objective beyond the horizon.

Following the opening speeches, the conference continued with panelists to discuss the topic of "Cyber Security and Defense Policies of Countries", "Strengthening the Cyber Security Clusters and the Cyber Security Ecosystem" and

"New Technologies in Cyber Security", where the cyber security directors from different countries, experts, NATO and Turkish representatives came together.

Session 1 "Cybersecurity and Defense Policies of Nations"

The first session of the conference, "Cybersecurity and Defense Policies of Nations", was held with the participation of Rear Admiral Önder Çelebi- NATO Allied Command Transformation; Mr.Christian-Marc Liflände- Head Cyber Defense Section Emerging Security NATO; Ms. Paula Walsh - Head of International Cyber Security Team UK Foreign and Commonwealth Office; Dr. Süleyman Anıl Retired NATO OTAN Head of Cyber Defense; Barış Egemen Özkan - Captain(N) OF-5 - SHAPE Cyber Operations and Exercise Branch Head NATO Allied Command Operations (ACO) and moderated by Mr. Mustafa Şeker Deputy Undersecretary of SSM.

The first panelist of the session, Rear Admiral Önder Çelebi, serving NATO Allied Command Transformation as Assistant Chief of Staff for Command and Control, Deployability and Sustainability, discussed NATO's defense policy and provided examples regarding how they are developing and improving cyber defense in NATO, capabilities and capacities. He stated "As you know, NATO, like individual nations and the other organizations, relies on information and communication systems to execute critical mission tasks such as consultation, planning, collaboration, logistics and command and control in order to execute a wide range of different critical missions. The allies are faced with an evolving complex threat environment. State and non-state actors can use cyberattacks in the context of military operations. In recent events, cyberattacks have been part of hybrid warfare. NATO and its allies rely on strong and resilient cyber defenses to fulfill the alliance core tasks of collective defense, crisis management and cooperative security. NATO needs to be prepared to defend its networks and operations against the growing sophistication of cyber threats and attacks. In order to pace with the rapidly changing threat landscape and maintain a robust cyber defense, NATO adopted an enhanced policy and an action plan, which was endorsed by allies at the Wales Summit in September 2014. The policy establishes that cyber defense is part of the alliance core task of collective defense and confirms that international law applies in cyber space and identifies and intensifies NATO's cooperation with industry. The top priority, depending on the policy, is the protection of communication systems owned by and operated by the alliance. The policy also reflects allied decisions on issues such as stream-lined cyber defense governance, procedures for assistance for allied countries and the integration of cyber defense in operational planning. In addition, the policy defines ways to take awareness, education, training and exercise activities forward and encourages further progress in various cooperation initiatives. Including those with partner countries and international organizations as well, it also foresees boosting NATO's cooperation with industry including information sharing and best practices. Allies also have confirmed to enhancing information sharing and mutual assistance in preventing, mitigating and recovering from cyberattacks. NATO's cyber defense policy is complimented by an action plan with concrete objectives and implementation timelines on a range of topics from capability development, education, training, exercise and partnerships. Allies pledged at the Warsaw Summit in 2016 to strengthen and enhance the cyber defense of national networks and infrastructure, as a matter of priority. Together with the continuous adaptation of NATO's cyber defense capabilities, as part of NATO's long-term adaptation, this will re-enforce the cyber defense and overall resilience of the alliance. When it comes to cyber issues it is easy to understand that NATO is only as strong as the weakest link. This pledge works at gaining the shared purpose and fair burden sharing of the nations to expend resources to strengthen their cyber defense, thus strengthening NATO. At Warsaw, allies also reaffirmed NATO's defensive mandate and recognized cyberspace as a domain of operations in which NATO must defend itself as effectively as it does in air, on land and at sea. As most crises and conflicts today have a cyber dimension, treating cyberspace as a domain will enable NATO to better protect and conduct its missions and operations." He shared that the NATO computer response capability protects NATO's own networks by providing centralized and round the clock cyber defense support to various NATO entities. This capability is expected to evolve on a continual basis to maintain the pace with the rapidly changing threat and technology environment. To facilitate an alliance wide and common approach to cyber defense capability development, NATO also defines targets for allied countries, implementation of national cyber capabilities via the NATO defense planning process. Rear Admiral Önder Çelebi noted "Cyber defense has also been integrated into NATO's smart defense project initiatives. Smart defense enables countries to work together to develop and maintain capabilities they could not afford to develop or procure at all. It also helps countries to free resources and develop other capabilities. The smart defense projects in cyber defense so far include, the malware information sharing platform, multinational cyber defense capability development project and the multinational cyber defense education and training project. NATO is also helping member countries by sharing information and best practices and by conducting cyber defense exercises to help develop national expertise." Rear Admiral Önder Çelebi shared information about the NATO communications and Systems school saying "It is going to be located in Portugal soon, where it will provide greater emphasis on individual cyber defense training and

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education. Also, we have the NATO school in Oberammergau, Germany and the NATO defense college in Rome, Italy which are other important NATO education and training facilities that improve individual and collective training."

Recognizing that cyber defense is about people as much it is about technology, Rear Admiral Önder Çelebi stated that "NATO continues to improve the state of its cyber defense education, training, exercises and evaluation. The annual cyber collation exercise, which is being conducted in Estonia right now, aims to integrate cyber defense elements and considerations into entire range of alliance exercise. NATO is also enhancing its capabilities of cyber education, training and exercise's, including the cyber range which is based on a facility provided by Estonia. To enhance situational awareness a memorandum of understanding was developed in 2015. The MOU is signed between NATO and the national cyber defense authorities of each allied nations. It sets out arrangements for the exchange of a variety of cyber defense related information and assistance to improve cyber incident prevention, resilience and response capabilities." NATO is facilitating the ability to federate via the Federated Interoperability by design initiative. Rear Admiral Önder Çelebi provided examples saying "We have a serious event that many you have already heard about: TIDE Sprint, a Think Tank event twice a year where we talk about interoperability challenges, the other is the Hackathon where we are looking for solutions to those challenges. We have the Cyber Warfare interoperability exercise where we are testing and verifying solutions. I would like to invite you to give your support for the participation in these events."

"The UK's National Cyber Security Strategy – Making the UK Secure and Resilient to Cyber Threats, Prosperous and Confident in the Digital World"

Mrs. Paula Walsh, Head of International Cyber Security Team, UK Foreign and Commonwealth Office discussed the UK's 2016-2021 policy. The New 5-year strategy was launched last year with a vision that "The UK is secure and resilient to cyber threats and that it is prosperous and confident in the digital world." She shared details about the UK's new national cyber security center as part of this strategy and a whole of government approach linked to it. She emphasized the need for international partnerships, across governments, business, academia and society saying "Last year we launched the national cyber security center. It is our bridge between government and industry. It's one expert organization focused on decrease the cyber risk and deliver better incident management, share knowledge and build capability. After one year in existence it has had 590 significant incidents, 30 of which required a cross-government response. Wannacry was a big test in May of this year for us where our hospitals, our national health service was hit. It's also looking at the active cyber defense, preventing attacks. Another example of active cyber defense is that they have managed to reduce the amount of time that a phishing site can remain online from 27 hours to 1 hour. We are looking at some of these transformative techniques that you can use automatically to deliver better security. The cyber security information sharing partnership is a key tool for us in terms of sharing information with industry. International collaboration, we have been engaging over the last year with 50 countries and looking at what we can do better together."

Mrs. Paula Walsh also provided more details stating "Our national security strategy in 2015 identified cyberattacks as a tier 1 threat to the UK and that was quite fundamental for us recognizing there was around 6 threats and that was one of the top threats. 4 out of 5 people in the UK bought something online last year, that's more than any other country, but that number is increasing in every country, it's very much part of our world and the trust and confidence in that is absolutely fundamental. Our aim is that the UK is the safest place to live and do business online and that's also what this strategy is looking to achieve. Underlying that, as well as the strategy, we have put 1.9 billion pounds, over the next 5 years, to help transform the way that we are looking at cyber security." She noted that the scale of threat complexity is increasing and that 80% could be defeated by implementation of best practices. Mrs. Paula Walsh stated that "The previous strategy thought

Mrs. Paula Walsh, Head of International Cyber Security Team, UK Foreign and Commonwealth Office

that the market would fix this, that we would see solutions coming out and we haven't. It is covered in 3 different areas: Defend, Deter, Develop."

"NATO's Role in Improving National Cyber Resilience"

Mr. Christian-Marc Lifländer, Head of Cyber Defense Section Emerging Security, NATO provided an overview of progress made in cyber defense across NATO. He highlighted the fact that, "On one hand the interconnected and open character of cyber space has offered really unprecedented opportunities to our economies and societies public and private sector. However, at the same time these characteristics make it easier for those who want to use cyber space for malicious activities. Cyber threats are growing both in numbers and in sophistication. My message to you today will be two-fold. It is a message of the need to improve resilience and a message of cooperation. "Article 5 of the NATO Treaty 'An attack on one is an attack on all' is really the strongest promise that sovereign nations can extend to one another. Mr. Christian-Marc Lifländer underscored this point saying "We have built this major international organization to make this promise credible. An organization that features a permanent consultation process, an elaborate military planning mechanism and an integrated command structure. The number one priority for NATO in cyber defense is really to ensure the protection of its networks." He continued "For allied cyber defense, NATO will continue to act as a facilitator for the development of national cyber defense capabilities. One of those tools is the NATO defense planning process, which is largely focusing on the operational aspects of cyber defense and the military aspects of

that domain. We have also made a decision to recognize cyber space as a domain of operations. Cyber defense remains a team sport; cooperation with allies, with partners, with international organizations, with industry and academia, it will remain fundamental for everything that we do." He summarized by saying "Cyber defense remains a team sport. It doesn't matter if NATO headquarters is protecting if our allies are not protected. It doesn't matter if our allies are protected if the key trade partners or their neighbors or the industries upon which they depend are not protected. I will not pretend that it doesn't take time and effort to develop these initiatives and relationships to build trust and share information. As Winston Churchill said 'There is at least one thing worse than fighting with allies, and that is to fight without them.' This work may not be fast or easy, but I think it is required and NATO is there to help you. We do this cyber defense work at NATO because it matters, and I think NATO matters because it does this cyber defense work."

The Cyber Defense Pledge that was made at the Warsaw summit was meant to increase national cyber resilience and is intended to be an important tool to deepen cyber defense capabilities at home and cyber cooperation across the NATO alliance. Mr. Christian-Marc Lifländer stated that "The pledge has 4 key objectives: First, to generate a strategic level attention on cyber defense issues. Second, to promote and prioritize investment in cyber defense. We also wanted to link NATO cyber defense mandate focused on strategic and military systems with broader national cyber defense objectives. We wanted the cyber defense pledge to serve as a platform for allies to share national best practices across the alliance. The evolving cyber threat landscape continues to underscore the importance and urgent nature of this continuing effort. After our bilateral discussions with allies, I can tell you that I think we still need to focus on resourcing cyber defense, and here I do not only mean financing, finding financial tools, but also how do we recruit and retain personnel. How do we enhance information sharing, how do we establish situational awareness, and I think the NCSC certainly is one way at the national level is a way to ensure that all these aspects come together. But, for us our efforts to strengthen cyber defense really doesn't end with allies as we all benefit when the NATO ecosystem is more secure, and NATO has more partners to collaborate with. There are several programs in play, but one that I would like to highlight is the Science for Peace and Security program where we have organized workshops, training courses and multi-year projects. This has been an important project in terms of allowing both organizations to automatize their sharing of information."

Dr. Süleyman Anıl, Retired NATO OTAN Head of Cyber Defense: "Cyber Warfare – the Tool of Choice for Modern Conflicts"

Dr. Süleyman Anıl, Retired, NATO OTAN Head of Cyber Defense discussed the Cyber threat landscape noting that it has become a national security issue. He shared "We have seen a glimpse of cyberattacks in Estonia in 2007 and then in Georgia, but the most interesting example was in Ukraine. When we looked at the Ukraine crisis and analyzed the cyber events there, we realized that the cyberattacks had started well before the attacks on the ground. Watching cyberattacks and having a good situational awareness will give an indication of what is coming up in conventional or non-conventional terms on the ground. Now it has become much more serious, recognized as a New domain of warfare by almost everybody and unfortunately there are challenges and especially in the legal aspects of this phenomenon." He continued with detailed examples of threats to critical infrastructures saying "Stuxsnet was an eye opener and lesson for almost everybody, related to the lack of resilience or vulnerabilities in the systems." The New element in hybrid warfare is the component of cyber space. Recognition is out there. Dr. Süleyman Anıl noted that "Nations including the US, France, Germany, Russia are updating their doctrines or strategies, reorganizing their structures, increasing investments and that reflects the recognition of the significance of cyber warfare within modern conflicts. The cost of conventional conflicts is so high now, use of non-conventional means is also another reason for cyber space being a tool of choice." Dr. Süleyman Anıl mentioned the Tallinn Manuals pointing out that "In the western world there is the recognition of the existing international laws and conventions and UN charters that apply to cyber space equally. That is challenged right now by another group that is lead mainly by Russia and China and that is why the discussions in the UN are not getting anywhere. There are different efforts in different international organizations to minimize the risk of security in cyber space, but that process is very slow and that's one of the reasons why the cyber threat landscape is elevated. There is good work which NATO sponsored but it is not an actual NATO product or document, the Tallinn Manuals 1 & 2 goes into the next level of this subject. Accepting that current international laws apply in cyber space is a starter, it doesn't really state the practical boundaries of how a cyber operation should be conducted. The Tallinn Manuals gives the next level of details of how cyber operations can be done within the frames of international laws and regulations and conventions in place in an informal way. Because of the lack of agreement in the UN, the OSC or other international problems, I think probably organizations like NATO and the EU will adopt, if progress is not achieved in other the international organizations, the Tallinn Manuals, as a guidance document for cyber operations."

Dr. Süleyman Anıl, Retired NATO OTAN head of Cyber Defense

"Cyber as a New Domain of Operations"

Barış Egemen Özkan, Captain(N) OF-5, SHAPE Cyber Operations and Exercise Branch Head, NATO Allied Command Operations (ACO) noted that the conference was a "Great opportunity from the national perspective to see all of the cyber stakeholders in the room coming from different disciplines, from military, government, private sector, industry and academia, having seen that everyone is interested here has given us hope for a better cyber posture from the national perspective." A past to present look at NATO's cyber perspective was presented by Barış Egemen Özkan. He noted that in 2002-2003 cyber was referenced for the first time in NATO documents. He commented that "Unfortunately the real trigger that alerted NATO were the cyberattacks in 2007 that knocked down most of the critical infrastructure of Estonia, which made NATO realize that cyber can be used as a destructive tool on the critical infrastructure of a nation. From that moment on, we have developed a couple of policies, revised them, but the last one is the enhanced cyber defense policy which was approved at the Wales summit in 2014. Cyber is part of collective defense which means that it can trigger article 4 and 5 operation for NATO and I would like to point out that international law applies in the cyber space domain. In the same meeting, the nations also signed cyber defense action plan which is the defining of responsibilities for different organizations within NATO toward operationalizing cyber. The second major milestone in NATO is the 2016 Warsaw summit, the point where nations recognized cyber as a domain of operation. Before that decision was made, we only had 3 domains, maritime, air and land domains. At the Warsaw summit the head of governments recognized that cyber space is the 4th domain." He discussed the focus on mission assurance saying "There is a shift in focus from information assurance to mission assurance. We realize that with cyber it's almost impossible to have 100% security on all of our networks, so rather than trying to close all the gaps, we want to shift our focus to mission assurance." He discussed how social media is also part of the cyber space domain, noting the kinetic effect of cyber weapons and that they are unique and distinct from the weapons that we have been using in the other domains. Barış Egemen Özkan stated that "In order to operationalize cyber, these 5 factors must be in the picture; full spectrum situational awareness, network awareness, mission awareness and threat awareness, that we have to put in one place and make sure that we get all the impacts of the vulnerabilities and the threat. In order to establish a full spectrum situational awareness, information sharing is a critical enabler for us. We realize that nations are very hesitant to share their information and cyber intelligence, which is fair because it is precious information for them. But our intention and aim is to create trust through well-defined processes within NATO so the nations will be less reluctant to share this information." An eye-opening figure was given, highlighting the impact of cybercrimes; as an outcome of research that was conducted 2 years ago, it was concluded that a minimum 1% of GDP is lost due to cybercrimes. Barış Egemen Özkan stressed that "We need to invest in cyber to save losses due to cyber-attacks. Remember, these days we are discussing 2% of GDP for military spending." In summary Barış Egemen Özkan said "This new domain of operation requires a cultural revolution. What we are used to with the other domains is not working for the cyber space domain. It is a supported function, it is not a supporting function. It is a provided function rather than a provider function. Cyber is drifting from J6 functionality to the J3 operational functionality and we have to recognize this. In the beginning of this month we had a defense ministry meeting and the secretary general made it publicly known that this cultural revolution that we are going through in NATO is giving birth to a New organizational construct that is name the cyber operations center, it will come out as a result of the NCS adaptation package. We are still discussing this new organization, its functionality, resources, roles and responsibilities and the authorities that this new cyber operations center will have. In the future, you will see that the cyber operations center to fulfill the needs of the theater component or domain adviser of cyber space as a New domain of operation, as we have for the other domains; LANDCOM, MARCOM and AIRCOM."

Session 2 "Cybersecurity Clusters: Collaborations to Strengthen the Cybersecurity Ecosystem"

Day 1 - Session 2- "Cybersecurity Clusters: Collaborations to Strengthen the Cybersecurity Ecosystem" was held on by moderator Mr. Oğuz Babüroğlu- Arama Search with the participation of Mr. Javier Tobal- Program Manager Spanish Cybersecurity Cluster; Mr. Ömer Korkut, STM Deputy General Manager; Mr. Salih Talay - Cyber Security Group Manager of Havelsan; Mr. Hakan Terzioğlu- Hague Member – Entrepreneur – Bizneta and Mr. İlhami Keleş -Secretary General of SAHA Istanbul Defense and Aerospace Cluster Association.

"Cybersecurity Clusters in Europe: The case of Spanish Cybersecurity Innovation Cluster"

Mr. Javier Tobal, Program Manager, Spanish Cybersecurity Cluster discussed cluster participation in International activities, noting that their contribution to the Spanish GDP is almost 25% in the cyber security sector. The Cybersecurity Innovation Cluster of Spain (AEI Ciberseguridad y Tecnologías Avanzadas) is the association labelled as excellent by the Ministry of Industry as the National reference in the sector. The Cluster brings together around 90 members between large companies, SMEs, research centers, Universities, and other public and private organizations interested in promoting new technologies and business development in the cybersecurity and new digital technologies areas. AEI (the Cluster) is founder member of ECSO (European Cyber Security Organization), member of the Directors Board as well as member of the Partnership Board with the European Commission for the cPPP. The Cluster has a wide

Mr.Javier Tobal - Program Manager, Spanish Cybersecurity Cluster

Session 2

EU and international activity itself and through its members and is committed with development of projects and services for its members in collaboration with other Clusters. Mr. Javier Tobal noted that their success comes from the fact that "All member companies small and large have a willing mindset, they share opportunities, smaller companies can get income from projects by collaborating with other companies in the cluster." The main objective of ECSO is to support all types of initiatives or projects that aim to develop, promote, encourage European cyber security.

"Cyber Security Collaboration Activities in European Organization for Security"

Mr. Ömer Korkut, STM Deputy General Manager discussed how information and communication technologies have changed our habits and introduced new challenges. He stated "Improvements in these technologies have created a more connected world. In this new digital era connectivity, has brought significant benefits but it has also posed new threats to global security. Individuals, companies, institutions need to be protected in this hyper-connected cyber space.

Mr. Ömer Korkut – STM Deputy General Manager

Since borders are blurred on the internet, cyber security has turned into an international challenge. It has been 10 years since the first major coordinated cyber-attack targeting and paralyzing a nation state's IT infrastructure. The scope of the threat is only likely to grow as we continue down the path of digitalization. The cyber-attacks that are carried out in many different ways, from ransomware to cyber espionage, have been seriously damaging people, institutions and even states. According to Europol only Wannacry impacted over 10k organizations and 400k computers 150 countries and was responsible for $4 billion in damage. In 2004 the global cyber security market was worth $3.5 billion. As of 2017 we expect it to be worth more than $120 billion. The cyber security market grew by roughly 35x in 13 years. While all other tech sectors are driven by reducing inefficiencies and increasing productivity, cyber security spending is driven by cybercrime. The unprecedented cyber-criminal activity we are witnessing is generating so much cyber spending that it has become almost impossible for analysts to accurately track. Global spending on cyber security products and services is predicted to exceed $1 trillion cumulative over the next 5 years, from 2017-2021. This means 12-15% year over year cyber security market growth through 2021. On the other hand, attack surface is also growing very rapidly because of the continuing fast digitalization, therefore collaboration in industry is necessary to tackle cyber security properly."

European Organization for Security (EOS)

EOS was created by European private sector providers in 2007 from all domains of security solutions and services. EOS is the voice of the European security industry and research community. Operating in 15 different countries, EOS Members provide security research, solutions and services across many security domains, including border, cyber, transport and crisis management. STM is the only Turkish company holding a membership of EOS at this time. The organization supports its member by providing access to business opportunities and by promoting at the highest level the implementation of innovative solutions in priority areas like cyber security, border control, crisis management, protection of critical infrastructures and transport security amongst others. The purpose of the organization is to provide a platform of collaborative work, insightful exchange of ideas and best practices between European institutions, European security industry, research centers, universities, local clusters and associations. Mr. Ömer Korkut noted that "The main objective of EOS is the development of a harmonized European security market in line with political, societal and economic needs through the efficient use of budgets. These topics are even more important when we are talking about cyber security. One of the working groups in EOS is the Cyber Security Working Group which aims to foster private-public dialogue between the industry, research institutions and the public sector to develop a harmonized European cyber security market. Cyber Security Working Group has the capacity to initiate dialogue and develop recommendations on sensitive issues such as cybercrime, intelligence, cyber defense, digital autonomy and other sovereignty related issues. I would like to emphasize intelligence here because in order to tackle today's international cyber security challenges we need to be proactive not reactive."

Havelsan and Turkey's Cyber Ecosystem

Mr. Salih Talay, Cyber Security Group Manager – Havelsan discussed the importance of cyber security technologies developed by the defense industries and their role in maintaining homeland security, the

position of Havelsan and their work in the cyber ecosystem. Emphasizing the importance of collaboration to improve the readiness level of a nation against cyber warfare, Mr. Salih Talay said "There's no doubt that almost all systems which are being utilized by us in everyday life such as: the energy distribution system, air traffic control systems, transportation, telecommunications and even the satellite systems, they are strictly dependent on the information technologies which are part of cyber space. Any incident that may occur in these systems may cause a significance decrease in the quality of life. It is clear that the biggest effects of an incident on critical infrastructure will harm national vital interests or if it's an enterprise it will lose and prestige and competitive capacity of the enterprise. We, as Havelsan, are conducting several command and control systems in our projects for the Airforce, Army and Naval forces. Even for the foreign countries we are developing command and control systems and exporting them. Cyber security has become also the most important factor in the military platforms today." Underscoring that international cooperation and coordination against cyber threats is mandatory, he shared that "Among Turkish Armed Forces Foundation companies, Havelsan took the lead in cyber security and, as we are producing the software and integrated solutions for our military and allied countries, we are the responsible company for cyber security goals. Havelsan's first goal in cyber security was to become the main regional cyber defense provider with its expert staff. We've started to develop the national and local cyber security products and services that our country needs in accordance with the national cyber security strategy. Therefore, we established our cyber defense technology center." Mr. Salih Talay expressed that "Addressing the current cyber security threats needs more action than developing national and local solutions. You have to be in competition with the global cyber security market and you have to use next generation technologies in order to defend against next generation cyber security attacks. Your solution has to meet 3 additional properties: they should be high quality, high

Mr. Salih Talay - Cyber Security Group Manager of Havelsan

continuity and of course they should provide high security." The number of current registered partners in Havelsan's cyber security ecosystem is 84 and 30 of these partners are actively holding a contract and working on current cyber security projects with Havelsan. Mr. Salih Talay shared details saying "11 of the partners are currently ranked as level A status, 28 partners are ranked as level B and 13 partners are ranked as level C. This leverage is mostly used to identify the right partners while collaborating on a project. With the cyber security ecosystem, Havelsan can easily find the right partner to build custom cyber security solutions for its local and global customers."

"International Collaboration Journey of Biznet and HSD"

Mr. Hakan Terzioğlu, Hague Member – Entrepreneur – Sales and Marketing Director at Biznet shared insight gathered from participation in conferences for the last 2 years and why they chose the HSD Hague security cluster. He noted that they started investigating from "The US and then we took it to Europe and ended up in the Middle East, to make sure we have looked everywhere." Biznet is a private company that only does cyber security including OT and IT for the last 17 years and was established in Ankara, and now has grown to Istanbul with a total of 65 staff. Mr. Hakan Terzioğlu expressed "We are dealing with the triad of cyber security. It consists of people, process and technology. We must establish mutual trust and to protect mutual benefit of the collaborative parties. Clusters are the perfect environment and foundation to establish collaboration in a respectful manner for each party; this is why we believe that clusters are the best incubators for international collaboration. The HSD cluster is very organized and focused and that was what we were looking for. It has strong international ties and doing international collaboration with pan European and other overseas countries. They have a moto: the triple helix of cyber security (which is what we are all talking about, but with one difference, it's working there in the HSD cluster. We need to grab this idea and take it even further and try to implement it for country as well, it's a very good opportunity for collaboration." Mr. Hakan Terzioğlu also gave examples of the tangible benefits they have received as part of HSD, he shared "We've also gained some role models for our existing customers in Turkey, some of the New stakeholders of HSD have already completed projects such as Smart Meters, for example, and they guided one of our customers on how to achieve that, how to prepare RFP and RFIs. They didn't make the same mistakes that Alliander made, they learned from their mistakes and that is invaluable."

Last panelist of Session-2, SAHA Istanbul Defense and Aerospace Cluster Association Secretary General Mr.İlhami Keleş conveyed detailed information to the participants on the activity areas, organizational structure and the functioning of the SAHA Istanbul Defense and Aerospace Cluster Association as well as the members' areas of activity and informed them on the activities held regarding Cyber Security. Mr.Keleş: "We continue to direct the Istanbul SAHA companies towards the area of cyber defense and endeavor to train human resources in this area by providing our companies the opportunities of the universities that cooperate with us to this end."

Mr. Hakan Terzioğlu - Hague Member - Intrapreneur - Sales and Marketing Director at Biznet

Session 3 "Emerging Technologies for Cybersecurity"

Day 1- Session 3- "Cybersecurity Clusters: Emerging Technologies for Cybersecurity"" was held by moderator Mr. Mustafa Dayıoğlu, Director, Cyber Security Institute, TÜBİTAK SGE with the participation of Dr. David Pickard, Manager International Security Programs, BAE Systems; Alper Botan, Director of Security Solutions, Thales; A. Metin Balcı, PhD, ULAK Haberleşme AŞ; Mr. Emre Tınaztepe, Director of Development, Zemane; Mr. Murat Hüseyin Candan, CEO, Barikat Internet Security and Mr. Abdullah Genceller, Project Support Engineering Director, sayTEC.

In the beginning of the panel, moderator Mr. Mustafa Dayıoğlu briefly informed the participants on the new technologies emerging in the world regarding Cyber Security and address the question for the first panelist, the Director of Security Solution, Thales, Mr. Alper Botan about the requirements and solutions of Cyber Security and what type of cooperation they offered as a foreign company for the establishment of a national eco-system in Turkey.

Mr.Alper Botan, Director of Security Solution, Thales: "The Era of Digital Transformation Started"

The initial panelist of this session, Mr. Alper Botan, Director of Security Solution, Thales Turkey made a presentation on the strategies to be followed in the digital transformation era and the new generation cyber security approaches. Stating that a new revolutionary process was being experienced, Mr.Botan continued, "Now we attained at the era of digital transformation. Two thirds of the global 2000 companies list in the world placed digital transformation at the center of their company strategies. 85% of them consider that they have only two years left for achieving digital transformation and surviving this competitive environment. 92% of these companies regard that they have to launch automation systems with artificial intelligence, at least a part of in-house, within the next 12 months. In summary, this digital transformation is for real and presently we are experiencing this process. The world outdistanced the innovation process on this issue. We are going through the early implementation period and this process will continue until the end of 2019. As Turkey, we have a period of approximately 5 years ahead and we have to make use of this time well. We have to complete the adaptation period swiftly and take solid steps as soon as possible."

Session 3

Defining digital transformation under 4 topics, Mr. Botan, "If we analyze digital transformation under four main topics, first would be the sales and marketing approach specific to the customer, second would be the approach of outfitting and reinforcing the employee with the new and future digital technologies, third would be an innovation product and business model, and the fourth topic can be identified as the optimization of the activities conducted with the technological facilities."

Underlining that the evolution in customer behavior entailed the digital transformation, Mr. Botan stated that maintaining information security and confidentiality in this process was critical. Mr. Botan emphasized the importance of relieving the concerns of the customers and continued: "For Digital Confidence we initially have to rely on the security systems, data and the systems processing them are being monitored."

Also speaking about the investments made by countries on digital transformation Mr. Botan stated that in France 5 main cyber security strategies were identified as part of the defense concept built in digital transformation and cyber security and continued: "This strategy document contains the establishment and development of cyber security R&D clusters while emphasizing on the requirement of rendering a forecasting and prevention based main national cyber security strategy until the end of year 2020. Moreover, the goal of positioning the cyber security products manufactured in France amongst the world's best products in this area is also clearly stated in this document. Toward achieving this goal, determination was made regarding support for the innovation regions, research centers, cyber security clusters and incubators and the France National Information Systems Organization was established to this end. This institution which is authorized to execute all types of control is also the certification authority. The first-hand control mechanism of these strategies is being conducted also by this institution."

Mentioning the specific cluster formed in France for digital transformation, Mr. Botan added that not only the startup companies but also the mentor companies took part in this cluster and continued: "Thales has also been selected as one of these mentor companies in cyber security area. The activities to be held within the scope of this cluster were identified as artificial intelligence, machine learning, big data analyses, block chain and cryptography. Following various eliminations, Thales determined 9 companies to be involved in this process on 11 October 2017 and these 9 companies launched their activities. Within this six-month period, these companies

Mr. Alper Botan - Director of Security Solution of Thales Turkey

Dr. David Pickard - Manager International Security Programs of BAE Systems

are expected to reveal various commercial products that can be offered to the market. While providing consultancy and market support to such companies, Thales will also include the products put forth in the Thales product range."

Underlining the requirement of the proceeding with new approaches, measures and precautions in the next decade Mr. Botan added, "We need to develop new generation systems such as integrated threat intelligence systems, new generation sensors and anomaly systems, artificial intelligence assisted big data and artificial behavior analysis systems, etc."

"BAE Systems – National Cyber Defense"

Dr. David Pickard, Manager International Security Programs BAE Systems discussed the company's role in national cyber defense. BAE system is better known as a defense company in other sectors. With the majority of their work in air, sea and land, they have very important partnerships in Turkey in both the air and land sectors. Dr. David Pickard noted that "Cyber is only 7% of our global business but that is roughly 5,000 employees and we spend 11 billion every year with a network of 25 thousand suppliers worldwide. In cyber that's often in the form of investment into early stage starting companies." The company has a range of customers from nations, governments, institutions, commercial sector, but they also look at financial crime, looking at data sets for anomalies, exploring cloud and digital including forensics. He pointed out that they are one of 5 companies that is certified by the UK government to help companies to recover after cyber security incidents and communications intelligence and with a 40-year history working mainly for the UK government and other allies in those areas. Dr. David Pickard elaborated on threat intelligence coming from the managed services that that they are providing stating "We are currently tracking 137 attack groups. One recent example, last year BAE systems was called in by the SWIFT network to look at the Bangladesh bank and the amount of money that was being stolen out of the servers due to issues that had been found in the SWIFT network. $951 million being stolen, that's a reasonable amount of investment and it wasn't by cyber criminals, that's by a nation state, because they wanted hard currency. It wasn't just a single exploit; it was a very complicated series of exploits. It took a long time to map as well as a long time for them to exploit it. Another example of an actor that we've tracked and uncovered recently is 'Snake' a Russian set, pulling together a lot of different pieces of evidence, and then looking at the targets that they go after. These are examples of the sort of threat data that we produce. We have this as a service and we are currently offering this service to Turkish companies. Hopefully we will be able to work more with Turkish companies in the future."

Making a presentation on behalf of Ulak Haberleşme A.Ş, General Manager Metin Balcı, Ph.D. expressed that Ulak Haberleşme A.Ş was established in April by SSTEK founded under the Undersecretariat for Defense Industries and launched its activities in August and extended information on the activities of the companies to the participants. Mr. Balcı said, "As Ulak Haberleşme A.Ş, we launched our journey with the vision on ways of generating new generation communication technologies solutions through national resources in an environment with increased security. While accomplishing this, we aim to reinforce our existence in the international platform as we make maximum use of the accumulations in the eco-system and again by increasing the patent and intellectual property rights to the maximum level."

Underlining that the Ulak Commercial and Public Safety Base Station Project was initiated five years ago upon the directive of the Undersecretariat for Defense Industries and that the product was currently under testing stage with the participation of the Telecom operators, Mr.Balcı added that the activities were completed as part of the MİLAT project launched 3 years ago toward establishing national network technologies.

Delivering a presentation on behalf of sayTEC Company, Director of the sayTEC Sales Support Group Mr. Abdullah Genceller stated that the number of the victims of cyber security in 2016 were 560 million people and added that besides the individual attacks, now institutions and companies were involved in cyber warfare. Mr.Genceller delivered brief information to the participants on sayTEC services provided and their products in this area and said, "I would like to briefly speak of how we protect our companies and our institutions as sayTEC. We have disk-based systems for keeping data. We also have our own patented technologies that we develop in certain layers. We work on securing the integrity, unity and non-revisability of data arriving at the center through the software we develop and we have an 8-stage security infrastructure to this end." Underlining that they were able to encrypt all types of IP communications and provided services to their customers to maintain the security of mobile devices and camera systems, Mr.Genceller added that they were capable of providing the security of in-vehicle smart systems in an encrypted way with the help of their own software.

Barikat CEO Mr. Murat Hüseyin Candan: "Human Resources Should Form the Center of the Operation Center"

Barikat Internet Security CEO Mr. Murat Hüseyin Candan shared the approach that embraced the cyber security issue as a whole without separating governmental and civilian associations and said: "We have to approach the cyber security issue in the following manner. In light of the published report within this scope; while the cyber attackers were able to hack the systems at a daily rate of 75% in 2004, the cyber security specialist or defenders of the systems were capable of noticing 8% of these attacks, so 92% of these attacks were either noticed after months or maybe after years or went unnoticed. It is assessed that since 2004, approximately $500 billion have been spent worldwide on cyber security. Despite all great

Mr. Murat Hüseyin Candan - CEO of Barikat Internet Security

amounts of investment made in this area, as we reached 2014, we are witnessing a ten-year period in which cyber attackers hacked systems on a daily basis at a rate of 100%, and merely 22% of these attacks were noticed daily by the preventers of the cyberattacks. This is how we put the cyber security problem through actual data. If we need to change certain things then we need to change this picture immediately. It is not possible to solve this problem through merely spending a lot of money on it. Instead of a highly invested center that resembles a space center, the Cyber Security Operation Center must have an approach, a point of view of its own. There are certain highly critical criteria in this approach as well. Cyber Security Operation Center is being defined as the place where a team with high capabilities operated and yet protection, detection, analysis and intervention remained in the background. For overcoming the vulnerability in cyber security, the human resources issue needs to be resolved. Unfortunately, the investments in cyber security are merely directed toward technology; yet investing in human resources that will make use of such technologies is also compulsory. We need to establish a structure where the technologies we own are used efficiently and the existing human resources capabilities are reinforced as soon as possible."

"Preparing for the Unexpected in Cyber Space"

Mr. Emre Tınaztepe, Director of Development, Zemane Information Technologies discussed the importance of recognizing perception rather than just the tools or products that are utilized. He compared cyberattacks to guerilla warfare, stating that depending only on usual, regular or expected cyberattacks are the key for understanding why we keep still failing at cyber security. He noted "We should consider cyber security as a whole which should contain at least 4 elements: technology, processes, people and the business. The absence of at least one of these elements will lead to what we call cyber security ignorance and it will be followed by an increased number of attacks. We should analyze what happens when an organization faces a cyberattack and how much time and resources it takes for an organization to realize that they are under a cyberattack. Unfortunately, 81% of the reported intrusions are not discovered by the internal security processes but rather by news reports, law enforcement notifications and external fraud monitoring teams. It takes approximately 146 days globally to discover a cyberattack, while this number is tripled for the EMEA region 469 days. The difference between these 2 numbers is due to the fact that the EMEA is facing less high-profile attacks when compared to other parts of the world. The high-profile attacks have already increased the level of awareness in the organizations in other parts of the world. I think this is also the reason why we started establishing security operations centers. The emergence of Technologies such as SIEM (security information event management) and the EDR (end-point detection and response) proves the fact that we should always expect a cyberattack and prepare for it." Dr. David Pickard discussed the main purpose of SOCs; which is in essence a facility that houses a group of people who are responsible for monitoring and analyzing an organization's security posture. He stated that "According to research covering 7 years of investigation of the SOCs globally, 82% of SOCs failed to score a maturity level of 1. Only 18% of SOCs scored a security operations maturity model level 3. This clearly indicates that we have finally accepted that we will be breached and started thinking about the solution." Emerging technologies were discussed, such as Authentication technologies, Data Encryption, Asset Management technologies, log collection backed by AI and machine learning, Intelligent Incident Response and Threat Hunting Technologies." He stressed that "Regardless of what product or technology we have, without qualified personnel and well-defined processes and procedures, these technologies will all be useless."

At the end of the session, the panelists assessed and underlined that the governmental mechanisms, incentives and other means needed to be used more effectively for achieving more qualified human resources in parallel with developing technologies and it was agreed that creating an education methodology extending to the base and increasing the interest of the youth in high schools and middle schools were necessary in particular, to increase skilled human resources and awareness in this area.

Day 2: "Discussion on Turkish Cyber Security Cluster Model"

On day 2 of the conference Undersecretariat for Defense Industries (SSM) Cyber Security and Electronic Warfare Systems Department Head, Mr. Muhammet Sami Ulukavak shared opening speeches with participants.

The main theme of Strengthening the Cyber Security Ecosystem and Cyber Security Cluster, Increasing Competitiveness and Development was discussed. The Academy of Public and Private Sector Workshop took place before the conference, exploring the results of Cyber Security Cluster model studies for establishment a Cyber Security Cluster in Turkey.

Mr. Ulukavak stated that 80 percent of Cyber incidents can be avoided with simple applications and stated that they perform important activities as SSM for the development of national software and hardware. Mr. Ulukavak shared that the cyber security clustering model for the cultivation of the cyber security ecosystem will be developed. "We have studied the cluster samples in the world and they are managed by a structure. For clusters in Turkey, they will be established and most likely

Mr. Muhammet Sami Ulukavak – Head of Cyber Security and Electronic Warfare Systems Department of SSM

managed by an association. The cluster will have a board of directors and cluster management units. It will help the firm with the operations of the management units, such as strategic market development, human resources, legal transactions and documentation."

Mr. Ulukavak said that companies are also facing trainee recruitment challenges and that a cyber security academy will be established within the scope of the cluster. Mr. Ulukavak said: "We will work on the project product organization with the clustering model that will be created, and we will work on selling the product both in the country and abroad as there will be work on the project product organization and there will be work done in these other fields and our work will not exclude them. Training activities will be conducted that will create local national awareness with the stakeholders and we will provide guidance so that existing funds will be used effectively both nationally and internationally. Informing participants on how to operate the conglomerate, Mr. Ulukavak stated "We will determine the application conditions of the companies that will be included in the cooperative."

Day 2 – Session 1: "Government, Academia and Industry Cooperation on Cyber Security"

Following the opening remarks on day two, the session was conducted under the title "Cooperation of the Government, Academia and Industry in Cyber Security." Assoc. Prof. Bilgin Metin from Boğaziçi University, Head of the Department of Information Society at the Ministry of Development Mr. Furkan Civelek, Director of Cyber Security and Big Data at STM Dr. Emin İslam Tatlı and Assoc. Prof. Ahmet Koltuksuz from

Prof. Bilgin Metin – Head of Administrative Information Systems Cyber Security Center at the Boğaziçi University

Day 2- Session 1

Yaşar University attended as panelists during this session.

Head of the Department of Information Society at the Ministry of Development Mr. Furkan Civelek took the floor first and conveyed information to the participants on the activities being conducted under the auspices of the Ministry of Development. Mr. Civelek: "We need to deliver a strategic, long term vision in order to create a successful eco system in Cyber Security area. We need to identify where we will position ourselves in a ten-year time frame. Moreover, training the human resources that will be in-charge of R&D and Product & Development will be one of the most critical parameters of this strategy. The incentives for R&D and innovation will have to be provided in a way to direct companies to this point, in parallel with the aforementioned strategic vision. Lastly, a demand should be created for national companies that are sufficient, elevating them to a scale where they could compete with their rivals."

Head of the Administrative Information Systems Cyber Security Center at the Boğaziçi University Prof. Dr. Bilgin Metin extended information to the participants on the activities conducted by the BUSİBER center operating under the auspices of the academy. Stating that the center worked on increasing the competence of trained human resources and generating national solutions regarding cyber security and for governmental cyber security, Prof. Metin added that they have been organizing summer and winter camps with the help of the cooperation between the industry and academia for providing human resources to the sector. Prof. Metin said, "We did not only explain the cyber security tools in these trainings, but also emphasized the background of the processes. Within this context, we provided training courses to the governmental institutions considering information security management as well."

Pointing out that they organized a workshop on Domestic and National Solutions on 8 May 2017, Prof. Metin said that they conducted training on cyber security awareness with the participation of various NGOs in different regions of the country and added that they translated the foreign literature on cyber security to Turkish. Stating that they aimed to provide all types of support to a cyber academy to be established with Boğaziçi University, Prof. Metin said, "While we discuss the establishment stages of the academy, we have to launch the training courses as soon as possible. On the other hand, we have to involve the Non-Governmental Organizations in this structure as well. The content of the training courses must be well-identified."

Underlining the urgent need to fill the gap between the theory and practice, Prof. Metin told that as Boğaziçi University they planned to create an atmosphere that would increase the practice of the students within two-year period through increasing such implementations. Prof. Metin said that they provided scholarships to the students with the help of the sponsorships they received and that these students seized the opportunity to practice in certain projects at the summer camp they held this year and expressed their wish to increase such examples.

Director of Cyber Security and Big Data at STM, Dr. Emin İslam Tatlı shared his views considering the model needed to be formed for the development of the cooperation among University, Academia and Industry with the participants in his presentation.

Assoc. Prof. Ahmet Koltuksuz - Yaşar University

Dr. Emin Tatlı: "The Cooperation between Academia and Industry should be Transferred to Practical Life"

Drawing the participants' attention to the issues Turkey has been experiencing in the Cyber Security area, Dr. Tatlı shared that there were certain critical steps that needed to be taken by Industry, Government and Academia, and continued: "All these problems are needed to be identified from scratch. Cyber Cluster Management must provide the appropriate guidance in innovation at this point. The innovation issue stands out at this point. We must be able to access the abroad market with the unique products on a global scale and here the cluster has a very critical mission. Academia and Industry in Turkey require a rather transitive type of cooperation. While it develops innovative products, the industry requires academic know-how in the business package. Yet, in academia there is a need for R&D projects in which graduate and PhD students can seize the opportunity to work in practical life so that they are trained in a qualified fashion. With this model, in which both parties will win, we can speak of a good model with the funds provided to the academic students. We now have to adopt this model from the current academic consultancy model in Turkey."

Havelsan and Yaşar University - Cooperation between University-Academia and Industry

Assoc. Prof. Ahmet Koltuksuz from Yaşar University made a presentation covering a concrete example regarding the cooperation between University and Industry.

Assoc.Prof. Koltuksuz stated that the cluster activities excited them and the academicians conducting academic studies can direct their enthusiasm towards the areas required by the country within the framework of the strategies built by the cluster and shared a fruitful example of the cooperation between Academia and Industry with the participants. Assoc.Prof. Koltuksuz: "Following our theoretical studies, we launched our activities with the target of revealing a product. To this end, we built a simulator named IFSIM. For training purposes, we built a simulator capable of providing either attack or defense training. During the organization in which we presented this product, we conducted negotiations with the representatives of Havelsan for the commercialization of this product and this negotiation turned into a concrete cooperation in the aftermath. We held a conference within this context and we will be conducting a joint activity comprising 11 universities in the Aegean region in 2018. This product we delivered turned into a cyber modelling cyber warfare, cyber intelligence laboratory center that we jointly established with Havelsan."

Extending detailed information on the simulator Assoc. Prof. Koltuksuz continued, "There is a huge database that operates in the background of this simulator. All cyberattacks that took place are registered over this database and we are capable of evaluating the activity, which is conducted easily by repeatedly simulating these attacks and giving points to trainees. This system also has a significant infrastructural architecture that is easily updated. The codes of this project were developed in a period of five years. Five PhD and 7 post-graduate students worked on the background. Currently 2 PhD and 3 post-graduate students are working on this project for implementing new concepts as well. This project, launched with an academic enthusiasm rather than commercial purposes, turned into a good product with the help of a successful scenario. We believe that we built a fruitful project example for the cooperation between academia and industry through this project."

Day 2 - Session 2: "Strengthening Cybersecurity Ecosystem with a New Turkish Cyber Security Cluster"

Upon the completion of the first session of the day, the second session was held under the title "Cyber Security Clustering through the academic perspective." This panel was moderated by Dr. Ahmet Ercan from Yıldırım Beyazıd University and President of the Northern Cyprus Campus of the Middle East Technical University Prof. Nazife Baykal, Head of the Information Technologies Department at the Prime Ministry Mr. Alpaslan Kesici, Cyber Security and Protection Projects Manager at the SSM Mr. Mustafa Özçelik, ODTÜ Teknokent Deputy General Manager Ms. Hanzade Sarıçiçek and Havelsan R&D Technology and Academy Director Assoc. Prof. İzzet Gökhan Özbilgin attended the session as panelists.

Goal for the year 2023 - 150 Companies and $1 Billion Turnover

In the session, discussing how clustering should be established through the perspective of the government, university and industry, Manager of Cyber Security and Protection Projects Manager at the Undersecretariat for Defense Industries Mr. Mustafa Özçelik took the floor initially.

In his presentation titled "What is a Cyber Security Cluster? What are the centers of attraction? What are the model implementations in the world?" Mr.Özçelik extended the following points to the participants: "When we elaborate on the cluster model in the world, we are speaking of a natural formation in which the cooperation between the institutions is effective. We can define the Cyber Cluster we discuss today as a thematic cluster under an industrial clustering. In order to achieve synergy, we need to establish a healthy relation between the Cyber Security Cluster and Industry and Institutions. We wish to support our SMEs becoming globalized in financial, infrastructural and technological aspects and put them into forefront. Our companies will manufacture their products, but it is not easy for them to turn these products into worldwide products alone, and at this point we expect the cluster to assume the role of an umbrella organization. The cyber security market reached the level of $80 billion and we adopted the goal of reaching 150 companies with a share of $1 billion by the year 2023."

Noting that countries such as Canada, America, United Kingdom, France and Singapore had different types of clusters, Mr. Özçelik shared the attraction points of the cluster

Mr. Mustafa Özçelik – Cyber Security and Protection Projects at SSM

which they will be declaring with the participants as well. Mr.Özçelik: "The companies reaching out to us after this conference, wishing to be involved in the cluster need certain reasons. We identified certain attraction points within this context. Accessing the local and foreign markets, branding, funding, access to capabilities, access to information and open source innovation concepts will be our attraction points. Our goal is to turn this cluster into the supplier of the government, we aim to make this cluster a brand and render it a counterpart in cyber security procurements. Without doubt, it is not easy to achieve this assertive goal, yet we will strive to fulfil this target through certain certifications and complying with various security criteria. Access to foreign markets is our other target; we are able to effectively conduct the marketing via the existing SSM offices abroad and through the ones to be established. We will attach importance to the interaction and information sharing with the other clusters as well. We surely need to build long term strategic cooperation with foreign companies. On the other hand, we attach great importance to the certification issue too; the concept of reliable products manufactured in Turkey would bring branding along. To achieve successful branding, we aim the cluster to provide professional support and consultancy to the companies as well. Moreover, we plan to prioritize the open source innovation concept. The technology in the cyber world does not change in a period of 50 years; technologies here may alter within just a year. At this point, the products developed by the start-up companies with 3-4 staff need to be transferred to relatively greater companies since such companies are capable of moving the technologies that they developed forward only to certain levels, these products need to be branded in the following process and in this context, we will also be supporting the acquisitions of start-up companies. Access to capabilities will be one of our most crucial issues. To be able to fulfil the human resources deficit, we will be focusing on summer and winter camps, long term internship opportunities and on the cyber security academy. In respect to funding, transfer of the governmental incentives to the cluster will be prioritized. The incentives provided in Turkey are not small, but they have to be scaled in line with the strategies. The cluster is expected to make agreements and protocols with governmental institutions to this end. We will be discussing the credit facilities within this context as well."

ODTÜ Teknokent Deputy General Manager Ms. Hanzade Sarıçiçek mentioned that as ODTÜ Teknokent they have been directing a huge cluster with 340 companies and 6500 R&D staff since 2000 and shared her experiences in this area with the participants: "A wide variety of companies in different scales from start-up companies with only 2 personnel to major companies such as Aselsan and Havelsan remain under our cluster. 110 companies exist within our TSSK (ODTÜ Teknokent Defense Industry Cluster) which has been active since 2010. We are once again the umbrella organization of our Teknokent Information Technologies and Telecommunication cluster. 160 companies remain under this cluster as well and 20 of them are active in Cyber Security area."

Sharing that each cluster had a unique structure, objective and vision Ms. Sarıçiçek continued, "Cluster establishment is a difficult and painful process, the formation of the legal and administrative structure, identification of the operational conditions, selection of the members and their inclusion in the cluster require an intense moral and material effort. A possessive umbrella organization bears great importance at this stage. The severe support of the Undersecretariat for Defense Industries in the establishment of this cluster will enable the acceleration of this process. But, in the aftermath the existence of a single association would not be sufficient, the cluster members need to possess this cluster and a management structure in which the cluster members have a say need to be created. As ODTÜ Teknokent, we have a single chair in the executive boards of TSSK and our other clusters of which we are umbrella organizations and the board elected in the general assembly direct these clusters."

Mentioning that she witnessed numerous areas and functions under the Cyber Security Cluster in the presentation at the morning's session, Ms. Sarıçiçek said that this structure will require a more comprehensive management structure. Ms. Sarıçiçek also noted that as the activities of the cluster increased during the process, the management structure may be strengthened gradually.

President of METU's Northern Cyprus Campus Prof. Nazife Baykal: "We have to raise Cyber Strategists"

Rector of Middle East Technical University's Northern Cyprus Campus Prof. Nazife Baykal shared her opinions on the increasing responsibilities of academia within the Cyber Security Clusters with the participants. Prof. Baykal said, "As of the level achieved by technology, we have been heading towards a world where the line between virtual and real world is unclear. A cyberattack that will occur tomorrow will be one we do not know today. In light of these developments, the responsibilities falling on the academy increase each day. When we speak of an increasing responsibility of academia we actually mean this; when manufacturing national products with added value, academia has a critical responsibility. While such unique products are being put forth,

Prof. Nazife Baykal - Rector of Middle East Technical University's Northern Cyprus Campus

academia is the place generating the infrastructure and information; moreover, the labor competence and training also fall under the responsibility area of academia. These two tasks bear highly critical importance for the structuring of both clusters and national cyber security. Numerous infrastructures, algorithms, science, technology and methodology we utilize in the products are the components we have been aware of for more than 50 years. I acquaint oneself with the artificial intelligence in the 90s when I was a student, most of the time we use the same algorithms. So, what has changed? All these projects we implemented as pilot projects at those times became investments that may turn into end products with added value with the development of Big Data, Cloud Technologies and the development of technology. Now, industry and academia have to cooperate more intensely and more frequently over scientific output. A structure that excludes artificial intelligence and smart systems may likely fight back attacks that have not been experienced yet. However, we now must design autonomous systems that are capable of learning, identifying security flaws by itself, forecasting threats that have not been experienced and taking action against such threats. To achieve this, the cooperation of Academia, Industry and Government is indisputable. In summary, academia must be a component in all the areas we generate technology. Unless the technology development processes are fed with the cyber security know-how and formation from academia, the damage may be huge. We are manufacturing multi-functional devices, yet a device we bought for $100 may return damage of hundreds and thousands of USD due to security vulnerabilities."

Assoc. Prof İzzet Gökhan Özbilgin - R&D Technology and Academy Director of Havelsan

Day 2- Session 2

Underlining the importance of raising cyber strategists as part of developing human resources and capabilities, Prof. Baykal said, "We do not yet have our cyber strategists who will generate our strategies, direct us towards the steps we need to take, and provide information to the decision makers by processing data. On the other hand, we are training Cyber Security Experts then again, we either send them abroad or lose them to other industries. If we manage to train qualified human resources in coordination with academia, our probability of employing them will increase as well. Therefore, we will be using the time and resources spent on training experts in the most effective manner." Stating that the manpower deficit in Cyber Security not only existed in Turkey but it existed in the whole world, Prof. Baykal said, "Where the requirement for cyber security experts in America in 2022 is predicted to be 1.8 million people, Turkey will be in need of 30 thousand cyber security experts in the next five years."

Havelsan R&D Technology and Academy Director Assoc. Prof. İzzet Gökhan Özbilgin extended information on the existing clusters in Turkey and their operations through the perspective of the private sector to the participants: "The cluster has numerous parameters. There will be many cyber security companies in various scales, they will have different expectations, companies such as Havelsan will have very different expectations. Therefore, the strategies must be very clear and the performance here has to be monitored closely. At this cluster, we need to put forth a road map that will increase our rate of local participation patiently without expecting too much gain in the short run. I assess that this cluster will be providing us more advantages if we adopt this model."

Underlining that this cluster has to be turned into a global center of attraction Assoc. Prof. Özbilgin added, "This cluster has to become a global attraction center. Surely, we have to stand firm about being local and national yet in certain times we have to be able to adopt global approaches as well, otherwise we would remain in our local market."

Taking the floor for the governmental sector's point of view, Head of the Department of Information Technologies at the Prime Ministry, Mr. Alpaslan Kesici said that the cyber security concept presently affected countries rather than individuals and added, "In Turkey, the cyber security awareness of the government increased significantly, and we launched the governmental structures to this end. The Ministry of Transport, Maritime Affairs and Communication, Information and Communication Technologies Authority and the Undersecretariat for Defense Industries assume critical responsibilities in this area. Meanwhile, the Presidency and the Prime Ministry gather the relevant

Ms. Hanzade Sarıçiçek - Deputy General Manager of ODTÜ Teknokent

institutions at certain intervals and follow the developments closely."

Mr. Kesici stated that they held various workshops in the past period with governmental institutions, academicians, NGOs (non-governmental organizations) and companies providing services in the cyber security area that they regard as parties related with the cluster and added, "The active participation and contribution of the parties are essential for a powerful eco-system. I would like to share the four articles with you that put forth the cluster and cyber eco-system in the cyber security action plan within the cyber strategy document of 2016-2019. According to this action plan, a cyber security eco-system national business model needs to be created, cyber security technology road map and research groups need to be formed, indigenous products and technologies related with cyber security need to be supported and finally the inventory of the companies providing services in cyber security has to be prepared. We will be discussing these four articles and finalizing them with yesterday's and today's sessions."

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Goodwill Agreement Signed by METU- ITU University and SSM

At the end of the 3rd International Cyber Warfare and Security Conference, a goodwill agreement was signed between the Undersecretariat for Defense Industries and the Middle East Technical University (ODTÜ) and Istanbul University (ITU) for the formation of a working group on the cyber security academy for the elimination of human resource deficiencies within the cyber security cluster.

According to the goodwill agreement, for the immediate improvement of Turkey's lack of human resources in cyber security, joint activities are to be conducted by forming a cyber security academy workgroup in order to inform the decision makers regarding the establishment of a model for an academy, identification of a strategy and a road map and the assignment of roles.

Cyber Security Cluster Declaration Declared to the Public

Deputy Undersecretary for Defense Industries Mr. Mustafa Şeker made a brief comment on the structure of the cluster after the ceremony and stated that they accomplished workshops and activities within 2017, with all shareholders in the eco-system, and held decision workshop in the beginning of November. Mr. Şeker: "Various workshops were held separately with the academicians, government executives and the executives of the private sector under the leadership and coordination of this workgroup, and within the scope of these workshops all problems experienced by each of the shareholders were revealed and the model of a cyber security cluster as a recommendation for a solution was studied. Finally, for the sound analysis and association of the output of all of the previously mentioned workshops, a Decision Workshop in November 2017 was held where all shareholders were represented, and the model of the cyber security cluster was revealed in detail. We discussed this issue here for two days."

According to the declaration made to the public opinion by the Deputy Undersecretary for Defense Industries a cyber security cluster will be established. Mr. Mustafa Şeker noted that for the establishment of this cyber security cluster, initially a founding board of directors will be formed by the relevant shareholders and by this board the activities for the establishment of a foundation, which will be in charge of the management, will be launched. Companies conducting product development and providing services through domestic and national resources will be identified and included in the cluster as per the conditions of becoming a member.

In the short and medium term, an information portal will be formed, and a primary product and technology road map will be determined. Activities and training to increase domestic and national awareness will be held with the participation of all shareholders. Mechanisms will be built to train human resources. The certification and standardization of companies will be held by the mechanisms built under the auspices of the cluster as well

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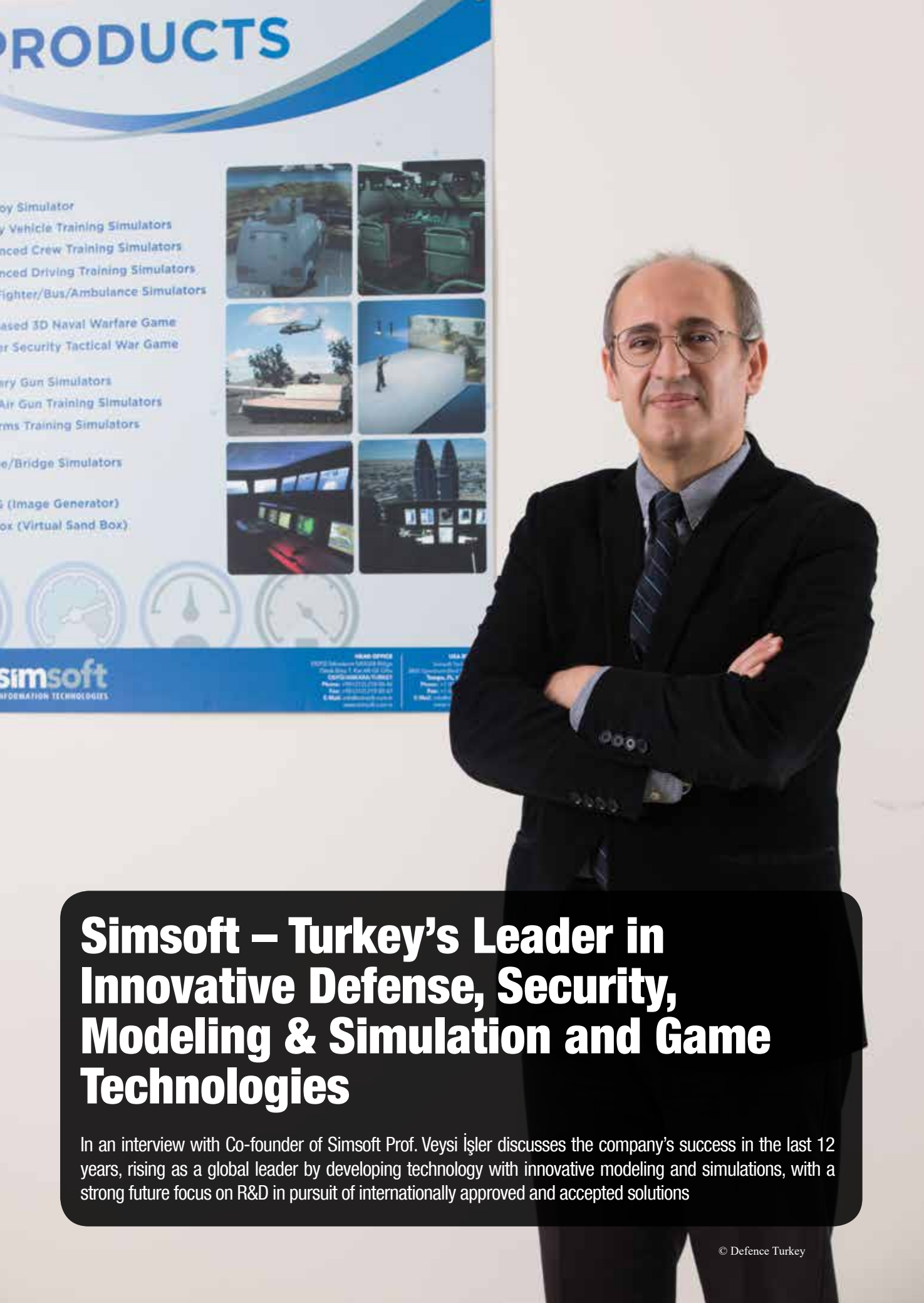

Simsoft – Turkey's Leader in Innovative Defense, Security, Modeling & Simulation and Game Technologies

In an interview with Co-founder of Simsoft Prof. Veysi İşler discusses the company's success in the last 12 years, rising as a global leader by developing technology with innovative modeling and simulations, with a strong future focus on R&D in pursuit of internationally approved and accepted solutions

Defence Turkey: First of all we would like to thank you for your time. Simsoft has been providing services to the defense industry since 2006 and it is obvious that Simsoft 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, and the history behind the last 12 years of successful achievement?

Simsoft was established in 2006 at the KOSGEB Incubation Center located in ODTÜ Teknokent.

The development story started with R&D projects in the areas of simulators, military software and serious game systems and have continued to this day.

We have developed and installed hundreds of simulators which are being used by both civil and military organizations and which have already delivered; including many software products of various scopes and areas to very well-known international organizations.

Initially, we established an effective "Quality Management System" ISO 9001:2000 and applied AQAP and MIL-STD standards on projects since the onset. We have steadily continued to improve our quality and project management systems and have been certified with CMMI Level 3 since 2014. We also have "NATO and National Confidential" Level Facility Security Reference and ISO 27001:2013 Information Security Management System Certification.

We have received many awards for successful projects and work we have done thus far. We can provide some details regarding some of these projects: Simsoft was awarded for being one of the top 50 technology companies in Turkey and 500 in European, Middle Eastern, and African countries by a Deloitte research in 2015. Simsoft was again ranked among "Turkey's Fastest Growing 50 Technology Companies" in 2017 by Deloitte's research. Simsoft has continued to demonstrate its growing success in both national and international stages with various awards such as "Software Design" award by Aselsan, "Qualified Collaboration Development Award" by Havelsan, "Best Serious Game" award by Kristal Piksel, and "Best Mobile Game" award by I/ITSEC (World's largest modeling, simulation and training conference) again in 2017.

Simsoft currently operates under five main groups: Simulators, Defense & Aerospace Systems, Visual Systems, Gaming & Simulation, and Information & Communication Technologies. Each group strives to develop advanced technology services and products in its area of expertise.

Simsoft's head office is at ODTÜ Teknokent Ankara and it has also offices and subsidiaries in Bilkent Cyberpark, Teknopark Istanbul in Turkey and Ashgabat-Turkmenistan, Kuala Lumpur-Malaysia and Orlando-USA abroad.

We can say a few remarks about the reasons for Simsoft's development and successful growth within 12 years. Firstly, a harmonious management system based on scientific principles in the working environment has made the employees more fruitful and efficient. Simsoft emphasizes the importance of personal development of employees. Simsoft offers a good training and working environment to our carefully selected staff. The young and dynamic team experienced in this way have developed remarkable projects and added value within the country for many years. Simsoft has also exported many competitive products to the global market with its constantly improving quality management system.

Defence Turkey: You have been making an important investment in R&D. In this respect, what would you like to say about your design and engineering capabilities as well as the R&D and infrastructure investments planned within this context? 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 in order to end our foreign dependency?

Simsoft has three R&D centers and one test and integration facility in Turkey (ODTÜ Teknokent, Bilkent Cyberpark, Istanbul Teknopark, TIMCO Test and Integration Facility) and three R&D centers in Orlando, Florida/USA, Ashgabat/Turkmenistan, and Kuala Lumpur/Malaysia. Based on the project requirements, Simsoft manages R&D projects with own employees at customer facilities.

Simsoft serves as a certificated subcontractor to main actors of the defense industry (Ministry of Defense, Aselsan, Havelsan, TAI, SSM etc.) Most of the projects, completed or ongoing, are R&D projects. Simsoft manage these projects with two approaches according to requirements. The first one is indoor (Simsoft facilities) development, and the second is outdoor (customer facilities) development.

Especially for the defense sector (which constitutes half of Simsoft's revenue), Simsoft has years of experience in managing R&D projects and R&D centers, indoor and outdoor.

Defence Turkey: You assumed responsibilities in crucial programs with your simulators for Land Vehicles and Naval Platforms as well as fire simulators. As one of the very few companies in Turkey in this area with depth of field, what would you like to say about the capabilities and products? What are the projects that you have accomplished and ongoing programs carried out?

As weapon systems and platforms are becoming more sophisticated and advanced, the need for training staff and operators to use these systems and platforms effectively in a short period of time is recently gaining more importance. The success of a critical mission will be based on trained personnel who execute critical decisions during uncertain and challenging conditions.

Simsoft develops simulator systems for sensitive and critical missions especially on Land Vehicles and Naval Platforms. Those simulators are designed to accomplish the need in full through arranged special scenarios in the direction of desired training results. Developed special scenarios

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are integrated with assessment evaluation abilities, and, therefore, providing maximum benefit for trainees. Developed simulators reflect vehicle dynamics with high fidelity and they provide accomplishment for the required training through desired scenarios.

Using the latest technology, Simsoft develops simulators offering effective and efficient training and immersive user experiences. With its hi-tech advanced simulation framework SimAll, Simsoft offers a wide range of simulators and simulations for different purposes such as driving, shooting, tactical and operational training and decision support.

Simsoft Simulation Framework, SimAll makes it possible for the company to develop any simulator in a relatively short amount of time with competitive conditions. The main military products are; Convoy Simulator, Firearms Training Simulators, Border Security War Game Simulation, Crew Training, Anti-Air Gun Training, Marine/ Bridge Training Simulators, Truck Simulators, Bus simulators and Car Simulators. Simsoft also has simulation based tactical and operational game-based simulation training systems for aircraft rescue and firefighting teams.

Over many years Simsoft has gained significant experience and expertise in providing simulation-based training systems for defense and security users with challenges. Now we have been announcing the new evidence based simulation framework enhanced with Artificial Intelligence for training.

We have already started the development of the new generation the SimAll 2.0 Framework using advanced Artificial Intelligence to make adaptive and evidence based training possible so that the training process will be more focused and individualized. In order to strengthen reality perception while representing real life situations we have been working on AR- VR technologies and R&D activities in Deep Learning and Artificial Intelligence.

Defence Turkey: You have sound capability in Naval Simulators. How do you assess your technology in making you stand out from other companies operating in your field in global markets?

Simsoft develops simulators for diving and floating marine platforms. These simulators are being used for sailing training of personnel in maneuver, approaching, and leaving. These are also used for training of users who are responsible for critical mechanical and electronic systems. Efficient training systems are provided for corporations through real lifelike, all kinds of geographic, meteorological conditions, and incident based scenarios by naval system simulators.

Some of the capabilities regarding naval simulators are Special Training Scenarios Management, Various Environment Conditions, Advanced Visualization, ECDIS Simulation, Performance Evaluation, Recording, Analysis and Debriefing.

Our experience in simulation gave us a chance to be involved in defense projects. We produced our first prototypes considering the needs of defense and learning from experts. In addition to the experience gained, we are an agile company and produce fast and sound products in a tailor-made approach. Our goal is to reduce domestic imports in maritime training by producing simulators and simulations that will compete in the international market. We have a lot of high quality software engineers and experts from universities which serves the needs of our customers by providing the integration power of simulator, simulation, virtual/ augmented reality, learning management systems, computer-based training, maintenance training, and platform dependent software development.

Defence Turkey: Simsoft runs projects and creates virtual system products for personal and corporate levels by accurately accomplishing intended population and needs analysis. Could you please enlighten us about your products, capabilities, technology, programs, and projects in virtual systems?

Simsoft's Virtual Training Systems focuses on Virtual and Augmented Reality Systems, Computer Based Training and Image Generator.

Simsoft develops user-specified solutions by immingling virtual and augmented reality technologies with its experience in modeling and simulations. Developed systems are used to serve the defense industry, science centers, education institutions, and the private sector.

Computer-Based Training is one of Simsoft's key application areas. Computer-Based Training provides a learning model that is unbound by time or location due to its use of information and communication technologies and is designed to present effective training by supporting multimedia content.

SimIG, Simsoft's Image Generator product, is a real-time Image Generator (IG) which renders large area databases with high-quality graphics at high resolution and fidelity. Simsoft has improved SimIG's capabilities named IMGE to be Turkey's National IG which is to be used in all flight simulators.

Training system products faces new challenges every day. Proximity, technology, economics and extended partnerships are the new topics. Simsoft takes proactive initiatives to address these topics. It is important to provide the customer with where, when and

how training is requested. When all this is considered; our primary goal of virtual training systems is to developed highly efficient products with cost-effective solutions. Thus, we can reduce the time spent for training and keep the throughput high.

Another important issue is the content development for virtual systems. The user is able to interact with the components on the system and perform tasks in a structured mode. When we prepare the content, we can work with subject matter experts to analyze customer needs fully. The content provided to the user in the systems increases user engagement.

As a result of all this, we can observe that the customers are more successful in practice and the fault rate is significantly reduced.

Defence Turkey: It is well known that Simsoft also provides software solutions for Weapon System, Command Control, Marine System, Avionic and Embedded System and Test systems; How do you assess your capabilities and products in defense systems? What are your ongoing programs and projects?

Simsoft develops and delivers software for weapon systems, air defense systems, artillery and surface to surface missiles.

We have the capabilities which include Software for Sensor Systems, Weapon Control Systems and User Interface, Algorithms for Target Detection, Target Allocation, Data Fusion Communication and Antenna Management Components.

Marine System Software collects data from related sub-sensors in required format and frequency, records and displays. Capabilities in this domain include Data Control and Display & Power Units, User Interface, Data Recording and Analysis Software.

Avionics Software employed in electronic systems of aircraft, satellites and space vehicles that comply with regulated safety and reliability requirements is developed by Simsoft. Some of our capabilities are Real-time Operating Systems, Mission-critical System Software, Embedded System Software, Hardware and Integration, Development of Symbology Library, GIS-based Mission Planning, Mission Analysis, Database Management Procedures, Sensor Mapping Analysis, Graphical Analysis.

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Simsoft also possesses a software testing unit that develops Test Software and provides software testing services for the conduct of third-party testing services in mission and safety-critical projects.

Defence Turkey: Simsoft also provides games solutions; Could you please share some information about your games for military applications?

Simsoft develops serious game systems through its sectoral level infrastructure and experience on simulation systems and tactical game applications. Serious games are real incident simulations that are intended to direct players in designated training and target purposes by using the fun focus of traditional games. Serious game technologies provide possibilities for players to accomplish real lifelike processes such as analyzing, decision, planning in a virtual environment.


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Simsoft's Gaming and Simulation applications have been used by many users from the military sector.

TAOSIM is a multi-user serious game developed for training Border Security staff in a friendly country. This game has various advanced features – the first one found in such projects and with literature of that kind. The users of TAOSIM interact via large touch screens in order to collaborate and perform the given tasks of the training scenarios.

TAOSIM provides a risk-free environment for tactical plan evaluation by showing the results in order to train the leader personnel who is responsible in tactical troops. It helps to build the skills of personnel in tactical planning and provides experience by using realistic scenarios.

We are offering high fidelity mathematical models, New Model and Behavior Creation Support, Artificial Intelligent (AI) Behavioral Model, Multi User Support, 1000+ Objects (Border Security, Land, Air, Sea) Support, Limitless Scenario Generation, 2D and 3D Map Simulation.

We also have other products delivered to some governmental entities.

ARSIM is a tactical and operational training simulation system for aircraft rescue&fire fighting. We are offering; two stage training (one-on-one and group training), computer based training support, multi touch screen support, tactical training, 2D/3D Visual Content, Game-Based Learning, Content creation, test database and test creation, performance evaluation and feedback, student and user management, scenario creation and management solutions.

TOPFIRE is also a tactical and operational training system for firefighting. It's a 3D simulation based training system aimed for Firefighters. The system supports unlimited scenario creation capability for fire, rescue and decontamination. Multi touch table or screen controller, 3D map, AI behavioral support, multi user play, realistic fire simulation, realistic 3D vehicles and objects are a few features of Topfire.

Defence Turkey: Simsoft possess striking design and engineering capabilities. Moreover, you are a notable engineering company in Turkey. Within this framework, what would you like to say about your existence in foreign markets and your collaborations with foreign partners? Could you please inform us about your ongoing programs in international markets?

Simsoft's goal for the medium term is to become one of the worldwide known companies in the areas in which it operates. We are intensively involved in international fairs, conferences and events, and we follow new technologies and products at these openings. We are conducting R&D studies in priority areas that we have identified. We are presenting products resulting from R&D studies in domestic and global markets.

Depending on the projects we are planning or conducting, we prefer to have representative offices in some countries such as Ashgabat-Turkmenistan, Kuala Lumpur-Malaysia and Orlando-USA. In some countries, we seek reliable contacts that are appropriate for our business discipline.

You can find some of the important projects and products we export to countries mentioned below:

- Fennek Pedestal Mounted Stinger System Training Simulator (Netherland),
- Trucks and Car Training Simulators (Azerbaijan, Turkmenistan),
- Marine / Bridge Simulator (Turkmenistan),
- Border Security Tactical War Game Simulation (Turkmenistan),
- Armoured Personnel Carrier Training Simulators (Turkmenistan, Bangladesh).

The positive results of our export-oriented activities carried out abroad have started to materialize. In the evaluation organized by the Turkish Exporters' Assembly (TİM), Simsoft was announced among "Turkey's Top 500 Services Exporters" in 2017. We believe that this success will grow even further in the coming years.

Marine/Bridge Training Simulator

Defence Turkey: Where is Simsoft positioned for the next decade, especially in the defense industry?

Simsoft's vision is to be one of the global leaders developing technology in the areas of Defense, Security, Modeling & Simulation and Game Technologies with the most innovative modeling and simulations, supported by strong research and development ability and internationally approved and accepted solutions.

Defence Turkey: Would you like to convey a message to readers of Defence Turkey magazine?

I would like to thank Defence Turkey for providing an opportunity for us to introduce ourselves to Defence Turkey readers

Mr. Cem Akalın – Managing Editor of Defence Turkey Magazine; Prof. Veysi İşler – Co-Founder of Simsoft; Mr. Kadir Temiz – Deputy General Manager of Simsoft

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The Steady Rise of Turkey's Unmanned Systems and Autonomous Vehicles

With the global spotlight on the development of UAVs and Autonomous Systems, Turkey's defense industry companies demonstrate their prowess with forward-thinking products, geared toward a network centric operational warfare concept, with new designs focused on interoperability, modularity, communication systems, intelligence utilization, autonomy and weapon systems

The "Unmanned and Smart Systems Workshop" in which visions for the Unmanned and Smart Systems for Land, Marine and Air Vehicles were shared, and the "Roboik - Unmanned and Autonomous Land Vehicles Design Competition Award Ceremony" were held at Bilkent Hotel in Ankara on 14th December

The workshop was held in Ankara on 14th December and the Undersecretary for Defense Industries Prof. İsmail Demir and representatives of various defense industry companies participated in the event. The opening speech of the workshop was delivered by Mr. Gökhan Uçar - Department Head of the Unmanned and Smart Systems at the Undersecretariat for Defense Industries. Mr. Uçar made an overall presentation on the activities conducted by the Undersecretariat, nationalized sub systems and visions on the future. Mr. Uçar stated that while the Undersecretariat for Defense Industries continued to fulfil the existing requirements of the Turkish Armed Forces, and as a result of the consultations conducted with the stakeholders, they pursued their strategic activities to develop the systems of the future in accordance with the operational requirements of the next decade.

Mr. Gökhan Uçar- Head of Unmanned and Smart Systems Department of SSM

Intervention - Protection and Logistical Unmanned and Smart Systems will Stand Out in the Upcoming Decade

In the presentation it was underscored that Armed Reconnaissance and Attack, Close Air Support, Air Defense Support, Target Identification, Detection and Marking, Riot Control Systems will stand out in the next ten years, while concepts relating to Search and Rescue, Medical Response, Engineering, Mine Sweeping and Neutralization, Bomb Disposal, Fire Extinction and Facility Safety relating to Protection, Transportation of Ammunition and Military Equipment as well as Combat Engineering concepts related to logistics would continue to gain importance.

Department Head at the Undersecretariat for Defense Industries Mr. Gökhan Uçar's presentation also featured unique Unmanned and Autonomous systems which have been developed and are in the inventory of the Turkish Armed Forces as well as the sub systems nationalized as a result of such development programs. In the presentation, it was mentioned that critical sub systems were nationalized such as Ground Control Station, Data Link, Remote Video Terminal, Satellite Ground Terminal, Engine, Image Processing, EQ/IR Camera, SAR, Wide Area Surveillance, Mission planning Software, Ammunition, Flight Control Computer, Autopilot and Automatic Take-Off and Landing Systems.

Addressing the participants in his opening remarks, Undersecretary for Defense Industries Prof. İsmail Demir underlined that human resources were one of the most critical issues regarding the defense industry. He stated that the workshop would provide significant input to the formation of human resources specific in this area and that it will contribute to the formation of the road map as well.

Prof. İsmail Demir – Undersecretary for Defense Industries

The Undersecretariat for Defense Industries has worked toward the training and development of human resources for the defense industry. Prof. Demir noted that the Defense Industry Academy launched the Defense Industry Youth Project which includes Middle School, High School and University students to direct the dynamic structure of youth towards new technologies, enhancing their awareness while raising the national conscience and self-confidence.

Panel 1 - Vision Sharing of Land Vehicles

Following the opening remarks, the Panel on Land Group's Vision Sharing commenced, moderated by Mr. Ahmet Raci Yalçın - Project Manager at the Land Vehicles Department of the Undersecretariat for Defense Industries. In attendance as panelists were BMC Project Manager Mr. Doruk Akyıldız, Program Manager in charge of New Projects at FNSS Company Mr. Koray Ulu and Unmanned Land Vehicles Project Manager at Aselsan's Unmanned Systems Projects Directorate Mrs.Çiğdem Şen Özer.

BMC Project Manager Mr. Doruk Akyıldız: "Amazon Vehicle – The firing tests of the Sarp Dual Stabilized Advanced Remote Weapon Platform have recently been accomplished in Qatar"

The first panel lasted for 30 minutes and the question and then answer session began. Initially BMC Project Manager Mr. Doruk Akyıldız took the floor and made a presentation on BMC's approach to unmanned systems and their activities. Mr. Akyıldız said, "BMC conducts activities on vehicle design and manufacturing as well as system integration. As you may also see on the slide presentation, we do not yet own an autonomous system activity that renders our vehicles unmanned. We are working on achieving the smooth operation of our systems and sub systems in our vehicles. Currently we are capable of integrating the Aselsan - Sarp Dual Stabilized Advance Remote Weapon Platform to all our vehicles. Within this context, in Qatar we recently have accomplished the firing tests of the Aselsan's Sarp Dual Stabilized Advance Remote Weapon Platform over our Amazon vehicle."

Mr. Doruk Akyıldız - BMC Project Manager

Mr. Akyıldız underlined that two critical unmanned systems would be integrated to the Kirpi MRAP vehicles as part of the New Generation Kirpi MRAP project signed on 8 August 2017 at the Undersecretariat for Defense Industries and he shared crucial information on this program with the participants: "Two major unmanned systems which are the Explosive Ordnance Disposal (EOD) Vehicle and the Improvised Explosive Detection and Disposal Vehicle will be integrated within this program. The robotic arm, to be integrated to the vehicles and the systems enabling the remote control of the vehicle, were developed by Aselsan. Moreover, Kirpi-2 vehicles will be equipped with the Sarp Dual Stabilized Advance Remote Weapon Platform.

Robotic Arm to Strengthen the New Generation Kirpi MRAPs

The robotic arm, that had been displayed in its prototype stage for the first time at IDEF 2017 at BMC's booth, will be integrated with the Kirpi-2 MRAP vehicles. These vehicles will be procured in line with the requests stated by the Turkish Armed Forces within the framework of the tender specifications and the responsibilities of BMC. Improvised explosives, mines and suspicious objects will be detected and destroyed with the help of the 8-meter long arm that will be integrated to the front of the vehicles. The system is controlled

The Robotic Arm displayed for the first time over the Kirpi MRAP at IDEF 2017

onboard and capable of lifting a maximum of 200 kg. It will have the following capabilities: Radar which is integrated to the end of the arm and capable of detecting cables and penetrating into the ground (Mini GPR), Imaging Cameras, Image Recording System, Cable Cutter Apparatus, Rake Equipment, Close Distance Imaging at the end of the arm, camera placement configuration for situational awareness at the rear of the arm, water ball equipment for responding suspicious objects, grip composite telescopic arm accessory for providing surveillance and intervention capabilities to its user within culvert, etc.

New Generation Kirpi-2 Vehicles Remote Controlled through the Portable Command Unit

Within the New Generation Kirpi-2 vehicle program, two new vehicles will utilize remote control of the vehicles through the portable command unit which is developed by Aselsan It will enable unmanned utilization with the help of the Tactical Vehicle Command Kit which will be procured as part of the program. It will be conducted and managed by personnel with the portable command unit located within the vehicle which can follow behind if required.

With the help of the Tactical Vehicle Command kit with a minimum of 500 m of (LOS) communication distance; the vehicle and payload capabilities can be remote controlled; In addition, the cameras will provide vehicle

image transfer and recording. The images received from the cameras can be transferred to the portable protection unit as a single or sectional image with 4 images. The detection and destruction of the improvised explosives and mines will be conducted securely through the robotic arm that will be placed on the front of the two unmanned Kirpi-2 vehicles which planned are planned for procurement. This project is expected to be completed within 2018.

BMC Project Manager "120 mm Automatic Mortar System will be integrated to BMC's 'Vuran' Vehicle"

BMC Project Manager Mr. Akyıldız mentioned that they also worked on a third system with Aselsan and added: "We will be integrating the 120 mm Automatic Mortar System to our 'Vuran' vehicle. By integrating this system to our vehicle, we will mobilize the mortar system. Therefore, after the target is fired, the vehicle will be able to swiftly displace its location when the position of the vehicle is detected and thus protect itself. We aim to complete this prototype in the second half of January 2018."

FNSS Project Manager in charge of New Products Mr. Koray Ulu: "When the Land Vehicle Manufacturers design the sub systems interoperable with the sensor technologies, the Autonomous Armored Vehicles Era will start in Turkey."

Program Manager in charge of new products at FNSS, Mr. Koray Ulu, enlightened the audience on the unique solutions and concepts developed in the world regarding unmanned and smart systems. "Hybrid vehicles will dominate the market from 2030 onwards. When we analyze the breakdown of this report, Hybrid Vehicles are expected to have a 28% share in the market, while gasoline powered vehicles will probably have 25%, electric vehicles 20%, plug-in hybrid vehicles 18% and diesel vehicles would take 9% of the market. Especially as a result of the investments made, battery

Mrs.Çiğdem Şen Özer- Unmanned Land Vehicles Project Manager at Aselsan's Unmanned Systems Project Directorate

technologies have become more cost efficient and we will be able to see more of those vehicles on the roads in the future", said Mr. Ulu.

Mr. Ulu noted that as FNSS they aimed to establish an infrastructure in which improved sensor technologies could be easily integrated to their vehicles and added that when the main contractors active in the Turkish Military Land Vehicles industry designed the products of the company such as Aselsan - a pioneer in Turkey in this area - interoperable with their own sub systems, the era of the autonomous armored vehicles would start in Turkey as well.

Unmanned Land Vehicles Project Manager at Aselsan's Unmanned Systems Project Directorate Mrs. Çiğdem Şen Özer informed participants about Aselsan's activities regarding unmanned systems, its future projections and investments.

Mrs. Özer expressed that within the scope of unmanned systems, Aselsan identified a method

İzci – Demo Vehicle

that developed and matured the identified technological constituents and determined concepts by testing them over the testing platforms and continued: "These technological constituents can be defined as follows. Detection, autonomy, self-operation capability, environment modelling, mapping, mission planning and self-determination and implementation and communicating with other systems within the environment and joint operation capability, which are quite crucial constituents for us. Throughout our studies and activities spanning more than 10 years, we developed these technological constituents by testing them over the unmanned platforms."

Stating that they launched these activities with the "İzci" demo-vehicle in 2005, Mrs. Özer said that they designed the first tracked concept demonstration "Gezgin" vehicle in 2010 for reconnaissance, surveillance and intelligence aims. Sharing with the audience the unmanned autonomous land vehicle development programs following 2010, Mrs. Özer said: "Our "Magic" vehicle which we developed in 2010 in a contest taking place in America was shortlisted. Then we started to develop the "Kaplan" Unmanned Land Vehicle Group in line with the requirements of the Turkish Armed Forces and our security forces. The vehicles of the Kaplan group are capable of carrying various payloads in accordance with various missions in rugged terrain. In 2014, we designed the Kaplan improvised explosive detection robot and our Kaplan Bomb Disposal robot was developed following this achievement and currently these robots are being procured by our National Police, and we have launched the deliveries."

Aselsan Preparing to Build Unique Improvised Explosive Detection Robot with Unique Sensor

Delivering information on Aselsan's road map regarding this area, Mrs. Özer stressed that they would be intensifying their activities for rendering the platforms unmanned in the upcoming period and continued: "We are capable of

rendering all types of platforms in the Turkish Armed Forces' inventory unmanned. We have no restrictions on any platforms. In the upcoming period we will be particularly concentrating on the tactical armed unmanned land vehicles. On the other hand, we are willing to reveal the unique Improvised Explosive Detection Robot, the sensor of which was developed by Aselsan in 2019. In addition to this, tiny disposable robots that could be launched and could provide intelligence also remain on our agenda. Within the scope of the requirements of the Turkish Armed Forces, we will focus on the development programs of the man-portable robots.

Following the completion of the presentations was the Q&A session of the Unmanned Land Vehicles Vision Sharing panel. In this session, the importance of the communication between the developed sensor technologies was underlined and it was stated that various tests were being held over the platforms to this end. In this session where the level reached by the rivals in the world was also discussed, the common approach of the panelists was that Turkey did not lag behind in any of the technologies and it was stated that both NATO's working groups and other developments in the world were closely followed. It was also mentioned that a crucial infrastructure began to emerge in Turkey and that the level of awareness increased each day while critical incentives and supports were provided by the government.

Panel 2 - Vision Sharing of the Air Platforms

Prior to the lunch break, the Air Platforms Group's Vision Sharing panel took place and was moderated by Mr. Oğuz Özbal - Tactical and Special Purposed Unmanned Systems Project Manager at the Undersecretariat for Defense Industries. Mr. Murat Koç from Altınay, Mr. Tayyar Süngü from Baykar and Mr. Nevzat Polat from TAI participated in this session as panelists.

Altınay Business Development Manager Mr. Murat Koç informed the audience on the products developed by Altınay regarding Unmanned Air Vehicles and the products in utilization as well as the future vision of the company. Mr. Koç said, "We have been conducting an exemplary cooperation with Aselsan in the development and production of an air platform which was delivered to Turkish Armed Forces in considerable amounts. Actually, our competence in this air vehicle covers the whole system. We have far-reaching competency in a wide variety of areas covering the autopilot software technology, mechanic design, sensor technologies, engine drive electronics and detection and collision avoidance sensors."

Mr. Koç stated that Altınay Company's Y6-850 platform capable of carrying 1 kg payload with an endurance of 30 minutes was off the shelf and added that their activities as part of the "Tepegöz" project and "PTT's drone" project were carried out with relevant institutions. He underlined that, within the scope of Altınay's vision activities, they continued to execute the Mini Class UAV program which will be capable of conducting operation, serial operation, kamikaze UAV and Search and Rescue tasks and he stated that they planned to reveal the prototype of this Mini Class UAV within 2018.

"Kaplan" Improvised Explosive Detection Robot

Mr. Murat Koç - Altınay Business Development Manager

Altınay to Introduce X4-S Mini and X4-700 Middle Class UAV Systems in 2018

X4-S mini UAV with 1 kg take-off weight will be capable of carrying payloads and have a LOS encrypted digital communication range of 2 km. With the help of its smart battery system, advanced level image fixation system and rapid installation, it will provide its user an operational flexibility in the operation environment.

Underlining that they also continued activities regarding Area/Convoy Security, Control and Mapping and X4-700 Middle Class UAV capable of taking off and landing over vehicles, Mr. Koç shared that this system will have an endurance of 60 minutes with its 5 kg take-off weight and 1 kg of payload capacity, and that it will be able to conduct an uninterrupted flight with its wired version that can be used over the vehicle. He stated that they intended to conduct the maiden flight of this product's first prototype in 2018.

Mr. Koç stated that the X8 system, which is currently going through concept activities, with triple redundant auto pilot and high carrying capacity will be able to carry a 15 kg payload with its take-off weight of 35 kg and he added that they will be revealing this system in 2018 as well.

Finally concluding that they launched the conceptual activities for the UAV Class with VTOL fixed wings, Mr. Koç stated that they aimed to form a VTOL fixed wing UAV group that can land on and take-off from vessels, transport ammunition and conduct launches. He stated that they intended to conduct the first flight of this UAV after 2019.

Bayraktar Tactical UAV System Surpassed the 35,000 Flight Hours

Delivering a presentation on behalf of Baykar, Retired Major General Tayyar Süngü presented critical information on the activities accomplished by Baykar from past to present, the latest status of the systems within the inventory and on the plans for the upcoming period. Mr. Süngü said, "As Baykar, we reached this point today from a tough path and we worked hard, our main approach here was to gain success without external dependency. In 2004, we accomplished the first national guidance system of Turkey. Simultaneously we completed the first national auto-pilot system through our own resources and young minds. If we did not accomplish these activities, we would be confronting problems in procurement and sustainment. With the vision put forth here, Baykar formed a dynamic R&D team. Today, 330 engineers and technicians with an average age of 30 years are working 7/24. With this team, we achieved numerous unique avionic systems nationally."

Retired Major General Tayyar Süngü – Baykar

Armed Bayraktar TB2

Expressing that a total of 38 Bayraktar TB2 platforms within the inventories of the Turkish Armed Forces, National Police and Gendarmerie General Command completed 35,000 hours of flight, Mr. Süngü added that 15 Armed Bayraktar TB2 have been successfully fulfilling their missions.

In his presentation, Mr. Süngü touched upon Baykar's vision for the future including the changing UAV concepts and approaches and said: "The TB2 platform we developed remains in the tactical class, however with the medium altitude at which it operates, and its endurance and mission, this platform slides towards the operative MALE class. With the changing concept, the conventional approach is changing too and with this new approach UAVs are now being categorized according to their mission planning. With its network centric warfare concept that has been gaining more importance in the operation environment of our times, the systems will now communicate with each other and this would create a crucial awareness at the command level. With the help of the acceleration of the decision-making processes, the quality and level of the command control processes will increase as well. When we analyze the UAV systems of the future, we see that concepts such as interoperability, modularity, communication systems, the protected usage of the data transfer in the electromagnetic spectrum and intelligence utilization, autonomy and weapon systems will stand out."

Stating that they launched their activities for the Attack UAV System (Akıncı) project, Mr. Süngü added that they have planned for the maiden flight this UAV soon.

Baykar- Attack UAV System to Carry 900 kg External and 450 kg Internal Payloads

On the slide projected on the screen during the presentation, the technical features of the Baykar's Attack UAV system were displayed as follows: 24 hours of endurance at 40,000 thousand ft service ceiling, 900 kg external – 450 kg internal payload capacity with 5 tons of take-off weight, Single/ Dual Turboprop Engine Drive and LOS/ SATCOM data network. The Attack UAV System will be capable of conducting Electronic Warfare, SAR Reconnaissance, Signal Intelligence, EO/IR reconnaissance, Ammunition Transportation and Wide Area Surveillance missions.

First Delivery of the Anka Block-SIB Configuration Completed

System Engineering Director at TAI UAV Systems General Directorate Mr. Nevat Polat made a presentation on TAI's UAV systems and capabilities.

Mr. Nevzat Polat- System Engineering Director at TAI UAV Systems General Directorate

Mr. Polat said, "Anka system does not consist of a single system, instead it has various blocks. Initially, there is our Anka Block-A system which was developed uniquely and the maiden flight of which was conducted in 2010 and then the acceptance tests were successfully accomplished in February 2013. Following this one, the additional payload, radar/intelligence systems were integrated and we developed the Anka Block-B system and then in the next stage there is our Anka Block-S system having the Satellite Communication."

Additional capabilities of the Anka UAV system compared to similar systems were shared with participants during the projected presentation. Noting that they accomplished the first firing of the Armed Anka System in May 2013, Mr. Polat added that they conducted the maiden flight of the Block-B system capable of carrying SAR payloads, with 24 hours of endurance at 30,000 ft of altitude to which they added additional capabilities in January 2015 and that the acceptance tests were executed in October 2016. He commented that they revealed the Block-S (first system under qualification stage) to which critical systems such as Satellite control, radio relay, encrypted communication, HD EO/ IR payload, National IFF, etc. were added, as part of the Anka-S program. Mr. Polat also mentioned that they built a Signal Intelligence configuration named Block-SIB in which radar and electronic warfare systems exist and advanced base concept and central control are in effect, for the signal intelligence tasks derived from the Block-B group.

In one of the slides in the presentation, the completion of the Block - SIB configuration's first delivery was announced, and it was also disclosed to participants that the first system of the Block-S configuration was under the qualification stage with its user.

Teber-81 and Teber-82 Ammunitions to be Integrated to Anka System

The presentation informed the audience that the Anka system supported payload integration in different types with the help of the wide payload compartment and its weight capacity. According to this, the payload options of the Anka System were examined under three categories composed of Reconnaissance Surveillance Systems, Signal Intelligence and Weapon Systems.

Following topics were presented: Under the Reconnaissance Surveillance title; EO/IR/LD/LRF Camera System, SAR/GMTI-ISAR Camera and Wide Area Surveillance System; under the Signal Intelligence title; COMINT/ DF, ELINT/ESM, HVAS; and under the title of Weapon Systems the 2,75 Laser Guided "Cirit" missile, the integration activities of which were completed, MAM-L and MAM-C missiles and Teber 81/82 general-purposes bombs which were shared for the first time with the public opinion and currently are under integration activities.

Extending information on the new platforms within their projections for the upcoming period, Mr. Polat stated that the development activities of the UAV system with a much greater payload capacity and HALE system continued and that they planned to conduct the maiden flight of the 3 tons Weight UAV system capable of carrying 800 kg of payload, in 2019. Mr. Polat mentioned that they aimed to make the HALE UAV system capable of carrying 300 kg of payload with 5.5 tons of take-off weight with longer endurance at higher altitudes.

Panel 3 – Vision Sharing of Land Platforms Group

The Vision Sharing of the Land Platforms Group took place during the second half of the day. This session was moderated by one of the consultants of the Undersecretariat for Defense Industries Mr. Özden Özben, and Mr. Yusuf Öztoprak from Katmerciler, Mr. Melih Şahin from Nurol Makine A.Ş. and Mr. Korkut Kibaroğlu from Otokar attended as panelists.

As the first speaker of the session, Manager of Defense Products Marketing Segment at Katmerciler Mr. Yusuf Öztoprak made a presentation on the activity areas, products, capabilities and future vision of Katmerciler. Mr. Öztoprak mentioned that

Katmerciler conducted activities regarding vehicle equipment in the civilian field while manufacturing tactical wheeled armored vehicles in the defense area and added that the company was expanding more each day with the unique solutions it developed regarding the defense industry.

Emphasizing that Katmerciler has also been investing in remote controlled Armored Tracked Excavator & Articulated Wheel Loader and unmanned autonomous land vehicles, besides the Tactical Wheeled Armored Vehicles, Mr. Öztoprak conveyed information to the participants on the Remote Controlled Firing Platform (UKAP) which was introduced at IDEF as well. Mr. Öztoprak: "As a result of the recent conflicts that emerged particularly in the urbanized terrain in Turkey, we determined to develop the UKAP platform. To this end, we launched the unmanned autonomous land vehicles development programs in 2016. The standard UKAP platform we developed is 2 meters in length and 1 meter high. This hydraulic and electrical platform lasts for 5 hours with battery and operates for 8 hours when supported with a generator. Its dry weight is 1.1 tons and it is capable of carrying approximately 2 tons of payload."

UKAP was Displayed for the first time at IDEF 2017

UKAP, all functions of which can be remotely controlled, was designed as a multifunctional vehicle with firing, surveillance as well as recovery operations.

UKAP is a tracked platform defined as a "genuine requirement for engagement areas" capable of reaching a speed of 25 km per hour and continuously operating for a duration of five hours. Delegations from land forces scrutinized and obtain information about the Weapon Platform. In the beginning of the design process, the vehicle was initially planned to be manufactured as a firing platform and now Aselsan's Remote Controlled Stabilized Weapon System is mounted over it.

UKAP Weapon Platform

Designed in a modular structure, UKAP can concurrently be used for reconnaissance and surveillance through thermal or sensor mobile cameras and for dispatching ammunition of military units. UKAP can also be utilized for recovery of injured troops and security forces that are caught in the crossfire and the vehicle is expected to become an important solution minimizing casualties in-theater.

Development studies geared toward enabling the UKAP platform to function as a task force in urbanized terrain and operational regions and those related to the platforms' integrated operations continue. Within the scope of the development project, a different configuration of the platform is aimed to be used as a mine clearance vehicle.

As part of the development of autonomous land vehicles the company has projected that two configurations in particular would stand out; Öztoprak added, "We believe that two important roles will be assigned to these vehicles in the short run. The less autonomous and cost-efficient systems with high firing capacities and effective reconnaissance capabilities will stand out in the inner city and forestry where the possibility of ambushes are higher. From the logistical perspective, interest in quiet, highly autonomous and cost-efficient vehicles capable of carrying ammunition, equipment and injured people will be increasing. We believe that in the upcoming period, cost-efficient Remote-Controlled Platforms, the parts of which could be easily changed, and which could be sacrificed during the operations, would be used more."

Nurol Makina A.Ş Delivered 500 "Ejder Yalçın" Armored Vehicles to Procurement Authorities

Making a presentation on behalf of Nurol Makina A.Ş., Deputy General Manager of Administrative and Financial Affairs Mr. Kemal Uyar stated that with the tactical wheeled armored vehicles designed with innovative technologies, Nurol Makina A.Ş. contributed greatly to the defense industry and to our country and informed the audience on the general structure of the company. Mr. Uyar said, "As of 2017, the number of Nurol Makina's employees reached 474 and 1/4 of this number is composed of engineers. In order to reveal innovative platforms, we are allocating 10% of our overall budget to R&D investments."

Stating that they manufactured various tactical wheeled vehicles in different configurations, Mr. Uyar underlined that "Ejder Yalçın" became a brand in armored vehicles and told that this vehicle was preferred by many different users due to both the platform's superior performance values and the sub systems it was equipped with featuring security components. In his speech, Mr. Uyar emphasized that they delivered 500 "Ejder Yalçın" Armored Vehicles to the procurement authorities thus far.

Noting that the Ejder Yalçın Armored Vehicle proved itself in numerous test environments in North Africa, Middle East, Turkic Republics and even in Balkan countries and that it displayed superior performance in these test environments Mr. Uyar added, "We are capable of integrating Anti-Tank Guided Missile, Cirit and SARP Remote Controlled Weapon Systems to our vehicles upon the requirements of our customers."

'NMS 4x4 New Generation Light Armored Vehicle' Armor Level can be Adjustable According to User Requirements

Sharing his expectations for the upcoming period with participants, Mr. Uyar noted that they have continued their investments in line with the feedback from the procurement authorities, the technological road map of the Undersecretariat and according the technological developments on global scale. Mr. Uyar added, "We unveiled our NMS 4x4 modular New Generation Light Armored Vehicle last May. 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 maneuver capability as well as easy configuration change feature, it can swiftly cater to the requirements of the procurement authorities. Our production activities for the procurement authorities abroad continue."

Stating that they benefited from the unmanned systems and semi-autonomous systems in order to keep up with the various

NMS 4x4 New Generation Light Armored Vehicle

requirements of the procurement authorities Mr. Uyar continued, "We are carrying out our activities with our stakeholders toward crested in urbanized terrain especially in the danger zone and border security and also for efficiently accomplishing missions. By launching projects such as "Tepegöz" that enables the transfer of the images to the vehicle's interior, which is the unmanned air vehicle capable of conducting wireless flights or flights over the vehicle through a cable, we enable the user to effectively conduct different missions in-theater."

Underscoring that customer requirements played a significant role in Nurol Makina's perspective of autonomous systems, Mr. Uyar added that within this context, all Nurol Makina's tactical wheeled armored vehicles featured semi-autonomous characteristics and that both the deployment and management of the vehicles and the control of the disposable loads over the vehicle from 5 km distance could be accomplished. Mr. Uyar mentioned that they had a crucial goal in front of them regarding this issue and said that they are eager to launch a fully autonomous vehicle at IDEF 2019.

Presentating on behalf of Otokar, Mr. Korkut Kibaroğlu noted that as a company developing tactical wheeled armored vehicles and weapon systems including the Main Battle Tank, Otokar has been conducting activities for integrating the autonomous and semi-autonomous systems to their systems and continued: "In the first stage, we wish to manufacture semi-autonomous vehicles that could control the vehicles externally and then in the following stages we aim to manufacture vehicles where all tasks are fulfilled by the vehicle autonomously. We can summarize our goal within this framework as implementing the technologies that maintain the driving safety of the classical manned armored vehicles into our vehicles and establishing the infrastructures of the autonomous vehicle technologies in our facilities."

Mr. Kibaroğlu underlined that more responsibilities were assigned in the classical approach to the drivers of the Armored Military Vehicles and therefore such drivers needed to be more competent and added that with the semi-autonomous activities, they aimed to minimize this driver workload by assigning it to the vehicle. Mr. Kibaroğlu continued, "Under the conditions when driving comfort disappears from time to time due to the status of the field or weather conditions, the workload caused by these factors will be assigned to the vehicle and the driver's responsibilities will be decreased with the various driving modes formed. In this way the driver will be able to control the other peripheral conditions and we believe this is quite crucial regarding situational awareness."

In the fourth and last panel of the Workshop, moderated by Ms.Özlem Sayın - Group Manager at the Undersecretariat for Defense

Industries in charge of Support Ship Projects, the Vision Sharing of the Marine Group was accomplished with the participation of Mr. Kubilay Çınar from Aselsan, Mr. Hakan Altınköprü from STM and Mr. Münir Cansın Özden from DATUM.

In his presentation on the unmanned systems employed by Aselsan's Marine Vehicle programs, Aselsan MGO Unmanned Land and Marine Vehicles Program Manager Mr. Kubilay Çınar informed the audience on the unmanned surface vehicles designed and developed by Aselsan for maritime reconnaissance, surveillance and patrol missions. Mr. Çınar stated that the Unmanned Surface Vehicles they developed were being utilized by the Naval Forces Command in various tests, training and operations especially with mine tests or targeting purposes and underlined that their aim within this context was to build a target group.

The R&D Manager regarding Marine Projects of the STM Mr. Hakan Altınköprü informed participants on STM's activities on autonomous marine vehicles and on the utilization of these systems in the world. Mr. Altınköprü shared that upon the developments in the world, unmanned marine vehicles were categorized under 4 different levels and continued, "The 1st level is composed of Unmanned Marine Vehicles of 0-7 meters in size, used by universities for research purposes, the 2nd level contains armed Unmanned Marine Vehicles developed for reconnaissance which are capable of operating in 2-7-10 thousand meters, in the 3rd level the Unmanned Marine Vehicles operating underwater exist and the 4th level covers the Unmanned Marine Vehicles with longer ranges, over 10 thousand meters. The tasks of these unmanned marine vehicles in the seas are as follows; antisubmarine warfare, port security, maintaining maritime security, surface combat, patrol tasks, Special Forces operation and mine sweeping operations. In the upcoming period certain changes are expected to take place in parallel with our projections in this concept." Stating that an operation concept in which autonomous marine vehicles of various categories are communicating with each other and acting collectively will be built, Mr. Altınköprü added, "Besides, these systems can be used as rescue vehicles when maritime conditions are unfavorable. We can see the systems capable of operating underwater that enable infiltration to the enemy-held territories. We assess that these systems could be utilized as electronic warfare and electronic jamming." Stating that as STM they were presently working on an unmanned marine vehicle for interception, Mr. Altınköprü said that they aimed toward maintaining the protection of both civilian and military ports.

"Levent" Unmanned Surface Vehicle

Finally, the founder of the DATUM , Mr. Münir Cansın Özden, took the floor and conveyed information on the activities conducted by his company to participants.

Following the presentations, Group Manager at the Undersecretariat for Defense Industries in charge of logistic ship projects, Ms.Özlem Sayın, shared with participants the Undersecretariat's projections and expectations from the companies of the defense industry. Ms.Sayın said, "We assess that these systems will be extensively used in many areas of defense, mainly in reconnaissance and patrol missions, mine detection and disposal, surface warfare, antisubmarine warfare and coast security. We closely follow the activities of our universities and local companies in this area. At this point, with the unique design and manufacturing of these vehicles, we expect our companies to also develop the software that would fulfil the tasks such as navigation, obstacle avoidance, mine detection, task performance analysis, in our country."

The Workshop on Unmanned and Smart Systems ended after the speeches and the "Roboik" – Unmanned and Autonomous Land Vehicles Design Competition's Award Ceremony was held

SSM - "Roboik" Unmanned and Autonomous Land Platforms Design Competition Award Ceremony

The competitors ranking the highest in the Unmanned and Autonomous Land Platforms Design Competition which was announced in January 2017 and in which 310 projects were evaluated by jury received their awards from the Deputy Undersecretary for Defense Industries Dr. Celal Sami Tüfekçi at the ceremony held upon the completion of the Unmanned and Smart Systems Workshop

Delivering a speech at the opening of the Unmanned and Smart Systems Workshop, Undersecretary for Defense Industries Prof. İsmail Demir extended critical messages to participants on how the competition's concept was formed, on its vision and their plans for the future concerning this issue. Demir mentioned that the Unmanned and Autonomous Land Platforms Design Competition (Roboik) held this year for the first time was planned by taking the aims and priorities into consideration as a result of an overall analysis of the conditions of the country and its vision and continued: "With Roboik, we said 'strech of your imaginations'. Within a short period of time, over 500 project applications were made from Van to Edirne, from Sinop to Antalya, throughout the country. 310 of them were selected for detailed review on 23-25 November at the evaluation camp in Ankara as they were complete and available for direct evaluation. The first twenty projects were identified after a detailed and multi-staged evaluation by a competent jury."

Mr. Çağrı Demirtaş

Stating that the importance of unmanned and autonomous systems has increased in the recent period, Prof. Demir stated that the people who have ideas in this area need to create channels for these ideas. Asserting that they would be providing all support for maturing and actualizing the idea, Prof. İsmail Demir expressed that the wheel will be spun by the sector representatives, researchers and rising generation.

In his speech, Undersecretary for Defense Industries Prof. İsmail Demir heralded a more dynamic competition season for the Roboik which will be announced in the first month of 2018 as well.

The Unmanned and Autonomous Land Vehicles Design Competition held for the first time this year under the name "Roboik" by the Undersecretariat for Defense Industries was launched for designing the unmanned systems that would enhance the operational capabilities both in internal security and in military areas through the utilization of advanced technologies, reducing the margin of error, preventing probable personnel casualties or reducing them to the minimum level, and for providing added value to the industry by enabling broad participation.

20 Projects out of 310 were shortlisted – "Efe Modular Autonomous Vehicle Project" became the winner

Mr. Uğraş Akpınar

Roboik Unmanned and Autonomous Land Vehicles Design Competition's planning activities were launched in January 2017. Within this context, the competition was announced on 12 June 2017 and the project applications were submitted until 19 October 2017 by SSM. Following the application process that ended on 19 October 2017,

Dost Autonomous Robot Project

310 projects were brought into the evaluation of the jury. At the evaluation camp held on 23-25 November, a software based assessment was conducted by the jury. During this three-day evaluation stage in which the owners of the projects were not known by the jury, 20 projects were shortlisted. On 14 December 2017, the Roboik Award Ceremony was held after the Unmanned and Smart Systems Workshop for highest ranking projects among the 20 shortlisted projects.

Mr. Uğraş Akpınar won the 100,000TL (est $26K) prize as the winner of the Roboik competition with his "Efe Modular Autonomous Vehicle Project" and received his award from Deputy Undersecretary for Defense Industries Dr. Celal Sami Tüfekçi. Mr. Çağrı Demirbaş won the second prize of the competition with his project "Dost Autonomous Robot Project" and Mr. Hakan Cavit Yıldız won the third prize with his project titled "Otosar Halka-II Project".

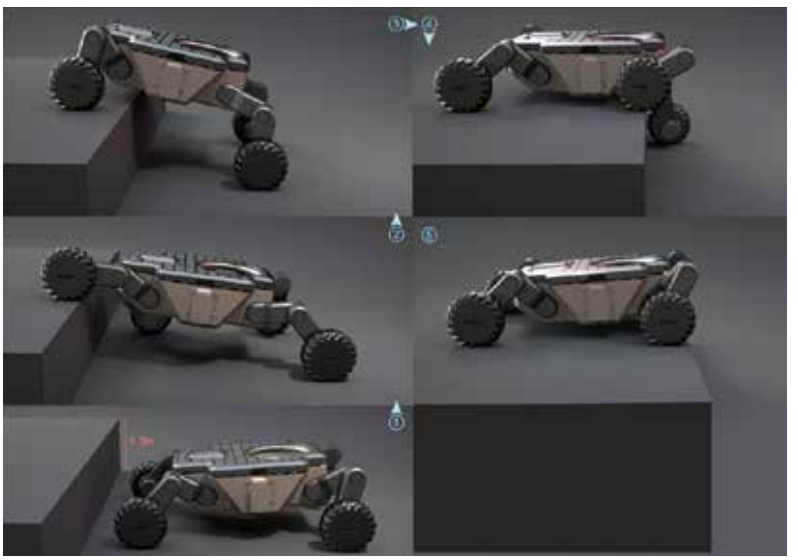
Honorable mentions as part of the competition were received by Mr. Levent Tuna and Mr. Cengiz Akarsu with the "Mergen Project", by Mr. Volkan Gökalp with "Atılgan-1 Project", by Mr. Tolga Yaşar Yılmaz with "Gergedan Project" as well as Mr. Utku Yücelmiş and Mr. Nurullah Taşkın with the "YUNT-6x6 Tactical Wheeled Unmanned Land Vehicle Project".

Mergen Project

Mr. Barış Bumin, Mr. Abdulkadir Uruç and Mr. Sayit Alişan received the jury's encouragement awards with their "Baykuş" project. Jury Head Prof. Metin Yerebakan handed these awards.

Prototypes will Compete in 2018

Following the Unmanned and Autonomous Land Platforms competition, a competition in two different categories is planned to be organized within 2018. The individual participants from universities entering this competition are intended to be run by giving them performance based tasks



Otosar Halka-II Project

focusing on algorithm and thus development of prototypes for companies are planned. In this format, the projects passing the pre-screening will move onto the next stage and the prototypes of the selected projects will be manufactured with the financial support provided by the Undersecretariat for Defense Industries. On the other hand, in addition to the Unmanned Land Platforms, the other formats related again with Unmanned Marine, submarine and surface vehicles are aimed to be launched in the upcoming period by the Undersecretariat for Defense Industries.

Vertical Firing Test Accomplished in “Hisar” Projects

In the December issue of the Aselsan magazine, it was announced that the subsystem integration test activities within the scope of “Hisar” Projects have been completed and system level development and test process has been initiated

Within the scope of “Hisar” Projects, vertical firing was accomplished for the first time and the 360-degree protection feature was successfully tested. The tests of Hisar (Unique Low / Medium Altitude Air Defense Missile System) were performed in Aksaray by Aselsan and Roketsan with the participation of representatives from the Undersecretariat for Defense Industries and Turkish Armed Forces. “Hisar” will play an important role in Turkey’s air defense capability. The radar, command-control / firing control, electro-optic and communication components of Hisar Systems also took place for the first time in the campaign where the control and guidance capabilities of the high-maneuvered “Hisar” missiles were successfully tested. Thus, significant progress was achieved in the system-level integration and tests. The target detection/ tracking, command control/firing tests as well as interim phase guidance tests were successfully performed.

The Low Altitude Air Defense Missile System (Hisar-A) and Medium Range Air Defense Missile System (Hisar-O) provides the capability to destroy fixed and rotary wing aircrafts, cruise missiles, unmanned aerial vehicles and air to ground missiles.

For air defense of mobile units and critical facilities, “Hisar-A” was designed to defuse fixed and rotary wing aircrafts, cruise missiles, unmanned aerial vehicles and air to ground missiles at a range up to 15 km.

“Hisar-A” consists of the Self-Propelled Autonomous Low Altitude Air Defense Missile System, Missile Launching System, Low Altitude Missile that can be launched both from “Hisar-A” and “Hisar-O” Systems, and Missile Carriage and Load System.

For the air defense of mobile units and critical facilities, “Hisar-O” was designed to defuse fixed and rotary wing aircrafts, cruise missiles, unmanned aerial vehicles and air to ground missiles up to a range of 25 km.

Due to its distributed architecture “Hisar-O” has the advantage of flexible deployment and includes a Fire Control System, Missile Launching System, Medium Altitude Missile, Medium Altitude Air Defense Radar, Electro-Optical System, Link-16 System, and Missile Carriage and Load System.

Aselsan is the main contractor responsible for system solutions in “Hisar” Low and Medium Altitude Air Defense Missile System Projects. In this context, the determination of system and subsystem requirements, as well as solutions such as communication, radar, electro-optics, fire control, command control, data link for missile interim phase guidance, seekers for terminal guidance are under the responsibility of Aselsan. Roketsan is carrying out the missile development activity which is one of the important components of “Hisar” systems.

“Hisar” is being developed together with more than a hundred local solution partners, mainly TÜBİTAK SAGE, Meteksan Defense, FNSS, Koluman, Savronik, YALTES and SDT.

Leonardo Demonstrates Mission Versatility and Prowess of C-27J Aircraft

Leonardo welcomed Turkish journalists to the C-27J Aircraft Media Tour, held from November 22-24, 2017 at the 46th Air Brigade in Pisa, Italy. Presentations were made during the event by Leonardo officials and members of the Italian Airforce on the mission capabilities of the versatile C-27J

A briefing was given by Italian Airforce L. Colonel Simone, providing an overview on the C/MC-27J along with a visit to the aircraft. Eduardo Munhos de Campos, Head of International Sales atLeonardo Aircraft Division presented an overview of the capabilities of the C/MC-27J. Insightful interviews and Q&A sessions were held during the event. A highlight of the tour involved an exciting hands-on, 'seat-belts on' experience in a C-27J simulator which provided an awe-inspiring sense of reality with an exceptional variety of modifiable factors such as weather and landing conditions. This event was held at the cusp of Leonardo's bid for the Turkish airlifter contest, a program with potential Turkish partners such as Aselsan, Havelsan and Roketsan.

Italian Air Force has Twelve C-27Js its Inventory

During the first presentation instructor pilot of the Italian Airforce L. Colonel Simone provided details regarding their mission introduction, history, organization and the fleet of the Italian brigade. The mission capabilities, worldwide operations and a brief overview of relative awards, and the training center were also mentioned.

The C-27J Spartan is the most effective multi-mission airlifter available on the market today. Its capability to operate from the most rudimentary airstrips in extreme environmental conditions cannot be matched by any other twin-engine airlifter. With its exceptional structural strength and systems redundancy, the Spartan offers unique qualities, not found in aircraft of the same class or derived from commercial turboprops: ruggedness, reliability, outstanding survivability and maneuverability.

L. Colonel Simone shared an overview regarding the mission of the Italian brigade, stating that "The mission is to ensure the tactical and strategic air mobility of forces and resources in the areas of national interest through preparation, transportation resupply and recovery of personnel and equipment in the field. He then provided a brief history sharing that the 46 bomber wing was born in 1940 and was located in Pisa. Throughout the years it was converted to an airlift wing and by the end of the second world war, it became an air transport wing In 1953, it became an air brigade and at just the beginning of the 70s we acquired the C130and then in 1977-1979 the G-222 aircraft. In the year 2000 the brigade got the C130J aircraft and then with the arrival of the C-27J the Italian Air Force Pisa Base reach an high level capabilities looking to the future..

The capabilities of the C-27J were touched on as L. Colonel Simone said "We fly our aircraft on emergency transport, personal airdrop and material and we have the capability to do medical evacuation, low level flight and unpaved runway and air to air refueling as a tanker for

the C130 as a the receiver for the C-27J.

The last one was in the Philippines which was operated by the C-27J in 2013 for the Typhoon." He noted that the last peace keeping operation was completed in Afghanistan and Kosovo. The Air brigade is the most awarded unit of the Italian Air force.

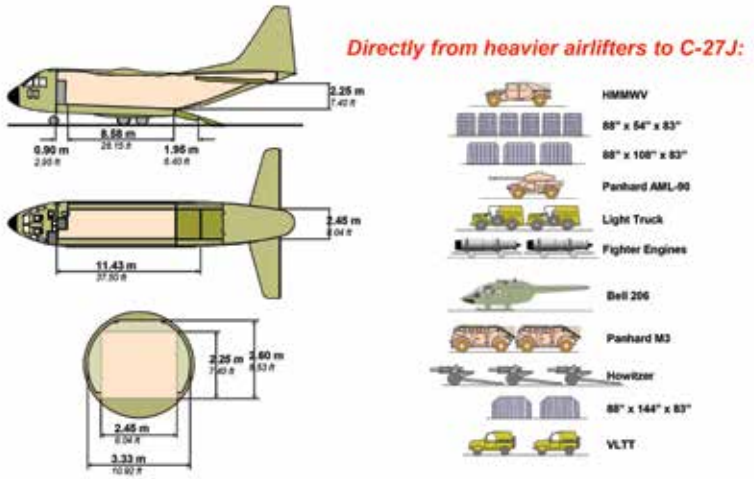
World Class Training Center and Training Program

L. Colonel Simone provided details about their training center stating "This is where we train all of our pilots, technicians and we also cater to our international customers. We have 2 main units: the operation and cooperation unit and the ground training unit. There's 2 branches which operate on both aircraft. Our primary task is to train pilots and master technicians on both aircraft. We have standardization with our annual exams and continuous review of all procedures, and we elaborate and verify and review the tactics and our training programs. We also develop new deployment of the aircraft, such as the air to air refueling which was our last one." He continued with his presentation by discussing their collateral activities. "We cooperate with all authorities and major commands and civilian companies for projects of common interest and we operate with the intention to enhance standardization and to review all of our tactics and procedures. We train pilots by dividing them in to levels. We go from basic qualifications pilots coming from the Academy and then we train them until they are combat ready. During the presentation, there were questions from participants regarding training time-frames and L. Colonel Simone elaborated and responded with details "We train them until they are combat ready which happens after a few years of training, after the Academy. From the flight school, it takes about 17 weeks to be trained – this contains the ground course and the simulator course. The flight line course is dependent on weather and many factors that often we cannot control. Typically, it is completed more or less within 6 months to become fully combat ready. Then, after a lot of flight hours they will start the aircraft commander pre-course and after 5-6 years they can become instructor pilots. The same is true for the instructor master and mission capability course as well. We also train international customers here." He stated that a variety of nations come to the training center for training on both aircraft, such as Australia, the United States and Lithuania, training on the C-27J. They offer a catalogue with all the courses that they provide and the customer can select which one they want. Training is customized and based on pillars, he continued "We also enhance them with mission capabilities to elevate the standards of our training. Our training is based on pillars: we have CBT (computer based training), lessons with an instructor, the second level is civil air training and then finally the flight line training." He also discussed the state-of-the-art multimedia classrooms and the avionic cockpit flight simulator for the C-27J – C130.

Instructor pilot of the Italian Airforce L. Colonel Simone

C-27J Main Performance from the Perspective of an Operator

L. Colonel Simone also summarized the logistic transport for the brigade stating that they can move 44 boxes 56 cubic meters and 3 meters on the pallets. With the largest cross section in its class, the optimally sized tactical transport capabilities are as follows: Payload (kg) C-27J Payload/Range Loading a 463L standard Pallet (88"x108"x83") at its maximum capacity and the floor height and inclination can be adjusted. The C-27J can efficiently and safely transport: up to 11,800 kg of payload up to 60 troops 36 litters + 6 medical attendants It can also precisely and safely airdrop: up to 9,000 kg of payload up to

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46 paratroopers. The "Spartan" features a ferry range of 3,160 nm. The APU (auxiliary power unit) allows autonomous operations in any conditions without ground support. He noted "We can operate on short and narrow fields, unpaved runways of any kind and NVG night vision goggles we can operate on runways that don't have lights. We can also do air to air refueling as a receiver from the KC767 of Italian Airforce."

An impressive Longstanding History of Success in Turkey over the Years Continues as Leonardo Competes in the Tender Process with the C-27J "Spartan"

A detailed presentation on the C/MC-27J Capabilities Overview was provided by Mr. Eduardo Munhos De Campos, Head of International Sales, Aircraft Division, Leonardo followed by a visit to the C-27J simulator which provided participants an opportunity to experience first-hand the exceptional variety of modifiable factors such as weather and landing conditions that are utilized during training.

Mr. Eduardo Munhos De Campos opened by saying "It is a very important moment for us to present the C-27J to the Turkish Press. We are participating in a competition in Turkey for a transport aircraft. We'll have to present our proposal for 9 airplanes and we have an indication that the number will increase during the process. It is a very important program for Leonardo and we are serious participating in that aspect. And a special thanks to the Italian Airforce that is receiving us in their home today. The Italian Airforce is our 'poster child' for the operation of the C-27J. It is also a main reference for us."

Mr. Eduardo Munhos De Campos elaborated on various areas of activity. "With maritime patrol special versions of ATR – we have 50% of ATR shares, but we are the only design responsibility owner to modify the ATR to make the ATR special mission airplanes. We are working today in Turkey with the MILGEM program submarine warfare and transport activity aircraft for Turkey. If you go Torino today, you can see one of the Turkish Airforce airplanes already back in Italy for the full certification of the airplane. It's a complex program and we are working very close with TAI. TAI makes a major modification to the airplane to install the submarine warfare equipment inside the airplane. We are also delivering airplanes to the Italian Armed forces multi-intelligence airplanes. He discussed the major fighter programs sharing that "We are partners in Eurofighter. We delivered airplane number 500 in April of this year to the Italian Airforce. We have several airplanes for the Italian Airforce in Torino but much more important than that, as Leonardo, we are responsible for 70% of the avionics inside the airplanes. When you think of the Eurofighter in terms of navigation and mission computers, Leonardo is responsible for 70% of the package of the airplane. We are partners in the F35 project. The only assembly line outside of the United States is in Italy, close to Milan. We assemble the airplanes and we have a huge chamber 30 meters high in which we can measure emissions of the airplane inside that chamber. All airplanes based in Europe or flying through Europe from carriers, for example will be supported by our facility close to Milan."

With an impressive family of trainer aircraft, Mr. Eduardo Munhos De Campos discussed the company's success in this area. "Another important part of our work is that Leonardo has been working with training airplanes for more


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Mr. Eduardo Munhos De Campos, Head of International Sales, Aircraft Division, Leonardo

than 60 years now. We are offering to the market today is not only the airplanes but a complete training solution, a lot of simulation together with the airplanes. The first airplane in our family of trainers today is the 345 which is a brand-new airplane and we are already flying one first prototypes and we will be flying the second fully configured airplane next year. The 346 is our very successful advanced trainer airplane. We have airplanes flying in Italy, Singapore, Israel and Poland. Today we've been selected by the UAE for 45 airplanes as well, leading edge technology airplane in the world today for advance training in operational units.

82 Orders by 15 Operators Placed for this Aircraft, all Over the World

Mr. Eduardo Munhos De Campos mentioned that "When we talk about the C-27 we first talk about the success of the airplane then technical aspects of the aircraft. We have 15 operators flying in the world today. Out of the 15 operators we have operators flying humanitarian missions and also military combat missions. A variety of missions. Instead of just talking about the airplane itself we also emphasize what our clients are saying about the airplanes, such as Italy, the United States and Australia." He responded to a question from the press stating that "78 out of the order of 82 have been delivered." The latest C-27J customer is Slovakia, which ordered two aircraft. The other customers are Australia (10), the United States (21- 14 used by the Coast Guard and 7 for the Army Special Operations Command-), Italy (12), Greece (8), Romania (7), Morocco (4), Mexico (4), Bulgaria (3), Lithuania (3), Peru (4), Chad (2) and an undisclosed sub-Saharan African country (2). In addition to that Italy, Romania, and the United States also purchased C-27J aircrew training flight simulators from Leonardo's Aircraft Division.

Mr. Eduardo Munhos De Campos provided feedback highlights regarding when and why the C-27J was selected by their clients. "Australia had a big fleet of C130s and they bought 10 C-27Js, and the main reason declared by the Australian Airforce is that the C-27J can access over 1,900 airfields compared to around 500 that can be reached by the C130. It can access more than 1,000 additional airfields. Because of the size of the runway, altitude or performance of the airplane the C130 cannot be used, but you can do with the C-27J. One of the main reasons for the selections of the C-27J is that the airplane can operate anywhere in the world. One of the main reasons why the United States selected the airplane is that the C-27J has a superior military operational capability. The C-27J is a real military transport airplane. At Leonardo we say, below the Hercules, the C-27J is the last real military transport airplane. You can land the C-27J anywhere, any runway, ice, snow, stones, sand, you can land anywhere. It is ruggedized and has the performance to operate out of remote areas."

C-27J "Spartan" Performs Various Missions with Multi-Role Capabilities

The Spartan is mission-proven by a number of prestigious Air Forces in tactical transport, disaster relief, "last tactical mile" troop support and Search and Rescue in the world's most demanding operational environments, including Afghanistan.

Mr. Eduardo Munhos De Campos discussed the interoperability maneuverability of the airplane saying "it's not about reaching the area but being able to approach or leave the area very fast, climb rate in/and maneuverability are very important aspects in the airplane, in

© Leonardo

Italy one of the aspects highlighted is about this. You can fly the airplane as a 30-ton fighter. Night Vision Operations: US special operations and Italian special ops use night vision operations, you can approach any airfield silently and take off from any airfield anywhere without support…Our motto is 'anytime and everywhere.' Few airplanes can operate fully with night vision and is certified.

The C-27J displays and lights (cockpit, cargo bay and the external lights) can be switched to "NVG Mode" to operate with GEN III, Type 1 Class B and Class A Night Vision Goggle. He continued by highlighting some of the operations performed by the airplane. "We have operated disaster relief missions in several very extreme conditions such as Equator, Philippines, Mali, Central Africa, Peru and also on several occasions also in the United States. Earlier this year, the U.S. Coast Guard deployed C-27J Spartans to assist in relief following hurricanes Harvey and Irma. We did a demo last year with our prototype, we went to Bolivia, La Pas, operating out of 14 thousand feet altitude, we did unprepared runways."

He also noted "We did a mission to Antarctica with the C-27J, and we did a mission with the Argentinian Airforce. We flew with 19 people on board and 2 tons of Cargo as an operational mission with the Italian Airforce. Mr. Eduardo Munhos De Campos discussed commented that "The C27 is in the 12 tons category and smaller than the Transall and the Hercules fly 18-19 tons. It's a significantly bigger than other airplanes like the 295 or the AM32s. We can fly up to 60 troopers, 46 paratroopers and we have a special missions medivac firefighting in the AP transport.

Details of the configurability of the aircraft were shared by Mr. Eduardo Munhos De Campos, noting how quickly the aircraft can be converted from one mission to another. He drew attention to the fact that "A full size ambulance with lights can be driven into the C-27J, for example a Toyota Land Cruiser can be driven into the C-27J. The other airplanes that are participating in the competition in Turkey, they

cannot do that. So, it is a matter of what do you want to do with the airplane rather than just analyzing the cost of the airplane."

Capabilities of the C-27J Spartan Aircraft

The C-27J has been designed, developed and tested as a military aircraft, and also has obtained civil certification from EASA / FAA in 2010.

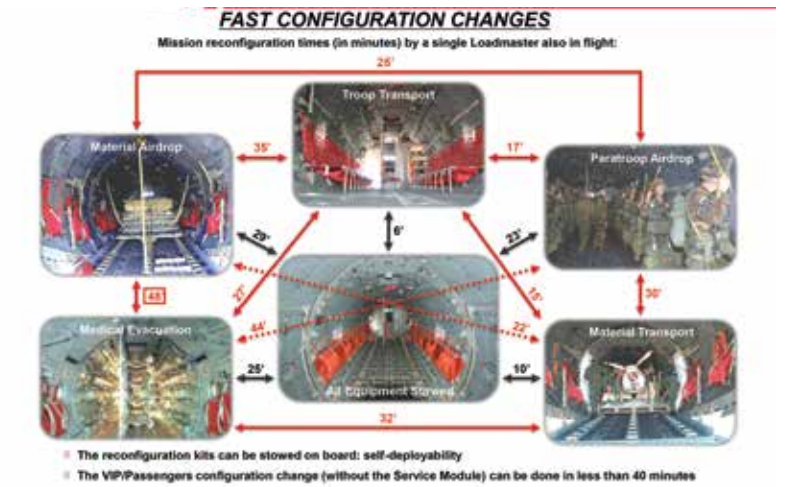
Thanks to its very versatile design, the C-27J is ideal for roles including troop and materials transport, medical evacuation, paratroop and materials airdrops, search and rescue (SAR), logistic supply, humanitarian support, firefighting and civil emergency operations support. Purpose-designed kits also allow VIP transport and other missions.

The Spartan has an unrivalled ability to perform short take-offs and landings (STOL) on snowy, sandy and unprepared airfields. And it is certified to do so. Compared with other military transport aircraft in its class, the C-27J has the best descent and climb rate (4000 and 2,500 ft/min) and can also perform 3 g tactical maneuvers, minimizing its approach phase and reaching a safe altitude more quickly in high threat scenarios.

The Spartan is qualified for extreme temperature conditions and it is capable of carrying its load in very hot and high conditions as already demonstrated in real operations.

The Spartan is a twin-turboprop tactical airlifter with state of the art technologies in avionics, propulsion system and other on-board systems.

The C-27J has a large cargo box, capable of supporting almost 5 tons per square meter. The aircraft can carry pallets or platforms weighing up to 4,550-6,000 kilos, or 60 equipped soldiers, 46 fully equipped paratroops, 36 stretchers



and 6 medical attendants or other combinations up to 30,500 kilos maximum takeoff weight.

It offers high operational effectiveness together with competitive costs, extreme flexibility, the best performance in its category in all conditions and unique interoperability with larger airlifters like the C-130 and the A400M. Vehicles can be unloaded from heavier airlifters, loaded on the C-27J and delivered straight to the frontline and austere forward operating bases without repackaging, dismounting parts or deflating tires, increasing safety and mission success. A standard 463L Pallets HCU-6E (88x108x83 in.) can be easily transferred from the C-130 to the C-27J with no reconfiguration thanks to the largest cross section in its class, the highest floor strength per unit length (4,900 kg/m) for the entire and cargo bay length the fully compatible Cargo Handling System.

The aircraft can operate from airstrips under 500 meters.

The two AE2100-D2/D2A engines are rated at 4,650 SHP. To increase safety and reliability, the avionics architecture is fully redundant and guarantees excellent performance and low pilot workload in whatever environmental condition and all operational theatres. Optional systems include air-to-air refueling, self-protection and head-up displays.

One version of the MC-27J, designed as "Praetorian", has been jointly developed with ATK for Command, Control, Communication, Intelligence, Surveillance and Reconnaissance (C3-ISR) mission tasks. It includes state-of-the-art sensors and communication systems controlled by a palletized mission management system.

For VIP transport, on dedicated pallets can be installed: A VIP area with 6 business class single seats and two foldable working tables A VIP/escort passenger's area with 18 economy class seats. The reconfiguration kits can be stowed on board: self-deploy ability. The VIP/Passengers configuration change can be done in less than one hour . One airplane to a client in South America is delivered that has a VIP kit also can be rolled in the entire section of the cabin inside the transport airplane and it can be converted from Cargo transport to VIP transport.

The airplane can quickly be reconfigured for Fire Fighting with the "GuardianTM" System has been already tested with the C-27J and permits to airdrop from a safe altitude (500-1,500ft), also at night, 6,000 lt of water/fire retardant on a single passage with no aircraft modification.

Fully Autonomous with APU

One fundamental feature of the C-27J is its APU, Auxiliary Power Unit, that make the aircraft fully autonomous in operations, also when deployed on remote, austere airfields (important for both the Land Forces and the Police) or when involved in disaster relief operations in hard hit areas, where ground infrastructure and equipment could be damaged or not available. The aircraft's APU (Auxiliary Power Unit), is fundamental also for flight safety as it can restart the engines in flight or be used as an alternate source of power in case of a problem with an engine.

Mr. Eduardo Munhos De Campos providing details and examples stating that "An APU is an auxiliary power unit, an additional engine, a third engine, that is able to generate energy for the airplane. This has 2 main objectives. First is that you can operate in a remote area independently – you start the APU and then you can start the main engines using that as the source of energy. The second important aspect is that if you are doing a military mission and you have an electrical failure you can get the energy that you need for the mission from the APU – so you don't have to abort your mission because of electrical failure. In some airplanes that don't have the APU you will have to abort the mission, such as with a generator failure. Another aspect is the safety for the crew. If you are flying and you have an engine failure, the APU can give you the energy for your cockpit and the basic systems of the airplane even if you have a complex failure such as engine and electrical failure in the airplane – those airplanes fly miles and miles away from the base, over the sea, over the jungle, over the desert. If you are far away from home you need to have a good navigation to return home. Sometimes if you have a combination of electrical and engine failure you need an APU to give you the energy to return back home. These are very important aspects that a military airplane must have. A civil airplane does not have to have that."

C-27J Provides Optional Ballistic Protection

The Ballistic Protection consists of aramid fiber and ceramic armor panels mounted on the aircraft to provide passive protection against the threat of projectiles from the ground. The following positions are protected by the panels: pilot and co-pilot (locations A and B in the picture) oxygen converters (locations C and D) emergency oxygen bottles (location E). The Ballistic Protection system can be rapidly and easily installed or removed. The Ballistic Protection System, supplied as a kit, is able to protect from the threat of the 7.62 AP or 12.7 AP bullets according to MIL-PRF-46103E. The is also an optional new defensive aids sub-system. A new version of the optional Defensive Aids Sub System (DASS) is available including: Missile Warning System with integrated Laser Warning System (MWS/LWS) Radar Warning Receiver (RWR), if required Chaff & Flare (C/F), 12 dispensers.

Another option that has already been developed for the Italian Air Force is the Air to Air Refueling "Probe & Drogue" System to refuel the C-27J from the AMI KC-767A Tanker. Other than transport, we also have versions of the airplane doing other missions – such as command and control, intelligence, gunship, firefighting, VIP transportation, maritime and ground surveillance. Mr. Eduardo Munhos De Campos also discussed the gunship installation "We did an integration of the 30mm cannon, inside the airplane and it has been demonstrated and certified the airplane to fly with the 30mm cannon. No other airplane below the Hercules can fly the 30mm cannon." Aspects of command and control were presented as well, he shared that "With the electro optic infra-red turret, the mx15 we also did mx20 which is a much bigger turret, the basic concept that we use is roll on roll off, you carry the pallets inside the airplane and you can convert from transport to a special mission in a manner of hours at the base."

Turkish Content, Turkish Participation

As the presentation was near closure, Mr. Eduardo Munhos De Campos answered a variety of questions from participants. There were inquiries as to whether the Turkish requirement was mission specific or for general transport purposes. Mr. Eduardo Munhos De Campos stated that "The basic requirement is for transport with protection, and self-protection for the airplane." He also shared that "We received indications from the government that the number may increase during the process. In the discussions, we will have rounds of questionnaires and interactions with SSM (the Undersecretariat for Defense Industries) with the government for clarification, we have a target to clarify all those aspects.

Responding to questions about SSM's requirement for Turkish content in the airplane in case that the C-27J will be selected, Mr. Eduardo Munhos De Campos said "We have already several interactions with the industry TAI, Aselsan, Havelsan, and we already have had some preliminary discussions about participation and cooperation. This is part of our strategy for our proposal. It is not finalized yet and it is something that we are working on. Yes, SSM has asked for Turkish participation, and specifically in Aselsan's case requirement for radio communication, and in the C27 and Leonardo proposal we are fully compliant with the SSM Turkish requirements." In-country supportability was another point of discussion. Mr. Eduardo Munhos De Campos stated, "It is our objective to have very important foot print to guarantee supportability of the airplane in country." Leonardo has an existing joint production model with the T129 "Atak" program. Mr. Eduardo Munhos De Campos was asked by Mrs. Ayşe Evers to elaborate on the possibility of new joint production or marketing to 3rd parties. In response, he stated "The

‘Atak’ program is a very successful program that we did with Turkey. We are open to discuss cooperation and joint productions with Turkey and that is something that we are still working on. That’s part of our proposal strategy.”

Long Term Plans for the C27

Mr. Eduardo Munhos De Campos provided the company’s long term plans saying “Today, we are committed for at least another 30 years with the production of the airplane. Which is a requirement of SSM, in their contract we have to commit with supportability of the airplane for another 30 years meaning producing parts. Having an active assembly line for parts for the airplane.”

Responding to an inquiry about interoperability with A400 and C27 Mr. Eduardo Munhos De Campos said “We have several cases including Italy, Australia, US, that I mentioned before where the C27 is working with the C130, although we don’t have an example working with the A400, but we know the capability of the A400. We know that the only airplane below the Hercules that can receive the package from the C130 or from the A400 and fly to another destination is the C27. Why is this so important? Distribution work can be done fast with the size of the cabin of the C27J. If you have a smaller cabin you will have to unpack and repackage the entire Cargo to upload and fly again. This is a major aspect as far as commonality and synergy with the existing C130 and A400 in Turkey.”

Eduardo Munhos De Campos Assessment on C-27J and their Vision for to Turkey’s Liaison and General Purpose Aircraft (GMU) Program

“Leonardo strongly believes the C27J is the best solution to answer to Turkey’s Liaison and General Purpose Aircraft (GMU) tender, considering, among the others, it has been designed, developed and tested as a military aircraft, and it is able to operate in truly demanding operational scenarios” commented Eduardo Munhos De Campos, Head of International Sales at Leonardo Aircraft Division.

“We think that Turkey does not need just a simple “cargo” aircraft, but a high performance and cost effective aircraft, capable of being quickly reconfigured to perform a high number of alternative missions, whilst retaining its primary role of tactical airlifter.”

“An important evaluation point for a modern Multi-Purpose Transport Aircraft will be the capability of the aircraft to operate in true operational scenarios” said Mr. Eduardo Munhos De Campos. “The C-27J, which is expressly designed for intra-theatre – both national and NATO/coalition operations – can be equipped with a full Defensive Aids Sub-Systems suite, secure communications and battlefield armour providing ballistic protection in order to operate in high threat environments, delivering cargo and people wherever they are needed including hot and high operations.”

The C-27J can be equipped with the latest technologies like Night Vision Goggles (NVG), ballistic protection system, Defensive Aids Sub System (DASS), air to air refuelling “Probe & Drogue” system, and operates missions going from the troops transport, Command, Control, Communication & Surveillance (C3-ISR), to firefighting, maritime pollution dispersion, and VIP/government transport, and more.

“Below the C-130 Hercules, the C-27J is the last real military transport aircraft. You can land the C-27J everywhere: aircraft is able operate with very narrow airstrips, on snow and ice, sand, gravel and slopes. We also did a mission to Antarctica with Argentinian Air Force. Our motto is Anytime, Anywhere” explained Mr. Eduardo Munhos De Campos.

The C-27J has the capacity to carry significant load and still access small, soft, narrow runways that are too short for the C-130J or runways which are unable to sustain repeated use by larger aircraft.

“In Australia – continued Mr. Eduardo Munhos De Campos –, the C-27J can access four times as much airfields compared to the C-130 Hercules. When we asked to our Australian customer why they chose our aircraft, they answered that the C-27J is able to fly further, faster and higher, while carrying more cargo and requiring a smaller runway than the other aircraft that were under consideration.”

“One of the main aspect of the plane is the size of the cabin, which can contain i.e. up to 60 equipped soldiers, a Fiat Ducato type ambulance or a small helicopter, guaranteeing interoperability with C-130 and A400M pallets.” The payload can be easily transferred from the C-130 to the C-27J with no pallet reconfiguration thanks to the largest cross section in its class and the highest floor strength (4,900 kg per square meter) equally distributed along the entire cargo bay length, suitable for the pallet’s transport and the fully compatible Cargo Handling System.

“It takes less than 40 minutes to completely change the configuration of the cabin, for different missions: you can convert it from troop transport or medical evacuation in VVIP/passenger configuration, and this makes this aircraft the most versatile in its category.”

“To summarize, the C-27J goes faster, farther, heavier and safer, and would be the right choose for Turkish needs,” concluded Mr. Eduardo Munhos De Campos.

Mr. Eduardo Munhos De Campos and Mrs. Ayşe Evers

Roketsan Arms Integration

When asked to comment on the integration of Turkish arms on the unarmed version, Mr. Eduardo Munhos De Campos stated "We are talking about the market now – Roketsan systems can be operated from the C-27J. We designed the airplane to have armed versions according the requirements of the Armed Forces. Roketsan has very capable armament systems and is part of the equipment that we can integrate incase an air force decides to have it. We have already talked with Roketsan, we have gotten all of the details about the armament – not only Roketsan but also from other suppliers – and we have that as a list of options for our guns."

Before taking the participants to experience the Simulator, Mr. Eduardo Munhos De Campos noted that the deadline for questions, answers and clarifications between the bidders and Turkey's procurement agency, the Undersecretariat for Defense Industries, or SSM, is Nov. 29 and that the contenders will submit their bids to the Turkish government by Dec. 29, 2017.

Simulator Tour

Excitement was in the air during the simulator tour. Mr. Eduardo Munhos De Campos commented that "The simulator is a real cockpit of the C-27J – so the students can really feel what it will be like in the aircraft. Special missions will have more panels but this is the baseline. We can choose the landing surface, weather conditions." As he was talking with participants the selected surface of snow cover was activated and participants were impressed, experiencing the simulation in action. Mr. Eduardo Munhos De Campos described what was possible and simultaneously demonstrated the simulator's capabilities, saying "We can make 100% snow coverage, and we can change the coverage conditions. If I decrease it… suddenly you will see a change in coloring. We can use night vision, and we can also decide the season which affects the altitude of the moon and sun. We can select a full moon or quarter and at what time and day we want to perform the simulation. You can see the stars (at that time on that day that star will appear there) rain and fog. We can change the wind direction and intensity, and we can change how many meters of visibility there is with the fog. We can also have layers of clouds, unprepared conditions, preformatted runway (grass, desert etc.). A participant asked if an unexpected hostile attack simulation of can be made. Mr. Eduardo Munhos De Campos responded saying "Yes we do have this type of software to train our force." Mr. Eduardo Munhos De Campos reminded passengers to wear their seat belts, as the sounds of the aircraft's engines roared and sounds of sensors attracted attention

C-27J Spartans Assist Hurricane Relief Efforts

The Coast Guard deployed C-27J Spartans – its newest medium range surveillance aircraft – to assist in relief following Hurricanes Harvey and Irma.

The HC-27J Asset Project Office (APO) in Elizabeth City, North Carolina, deployed two C-27Js in response to Hurricane Harvey Aug. 28 to Sept. 4. During this time, the aircraft flew just under 50 hours and completed 31 sorties, transporting approximately 210 people and 75,000 pounds of cargo.

Air Station Sacramento, California, also deployed a C-27J with Pacific Strike Team and Sacramento personnel aboard Aug. 28. The aircraft carried an all-terrain vehicle, rescue skiffs, pollution response equipment and medical supplies to Mobile, Alabama.

The HC-27J APO also deployed a C-27J to Air Station Borinquen in Puerto Rico to aid in Irma relief efforts Sept. 8-13. The aircraft transported Coast Guard liaison officers, disaster assessment teams, urban search and rescue teams, U.S. Army Corps of Engineers personnel, mail from the U.S. Postal Service, and relief supplies – a total of 42 passengers and more than 30,000 pounds of cargo. The aircraft also conducted post-storm reconnaissance of the Bahamian island Great Inagua and transported parts for cutters that had evacuated from Florida to Guantanamo Bay, Cuba.

"Throughout hurricane response operations, the C-27J proved to be well suited for rapid movement of small- to moderate-size loads of personnel, equipment and supplies over relatively short distances," said Capt. Eric Storch, HC-27J APO commanding officer. "The availability and reliability of the deployed C-27J aircraft provided planners with an alternative to dedicating the larger C-130 aircraft that, if used, would have flown with a partially empty cargo compartment." He added that the APO's deployed C-27Js flew more than 50 sorties and over 90 flight hours total for both hurricanes.

Seven C-27Js are stationed at the HC-27J APO, and six are stationed at Air Station Sacramento, California. The 14th and final C-27J is scheduled to arrive at the APO later this month after undergoing regeneration work to bring it out of long-term storage.

Wing-Assisted Guidance Kit (KGK) developed by TÜBİTAK SAGE -Locked and Loaded

The introduction ceremony for the KGK Wing-Assisted Guidance Kit was held at the TÜBİTAK Feza Gürsey Conference Hall. The KGK was developed and produced by the Scientific and Technological Research Council of Turkey, Defense Industries Research and Development Institute (TÜBİTAK SAGE) with national facilities.

Mass production has been launched for the Wing-Assisted Guidance Kit (KGK), in order to acquire guidance and long-range capability for general purpose bombs. It was designed and developed by TÜBİTAK SAGE which carries out its studies with the motto "National R&D for National Defense."

Deputy Undersecretary for Defense Industries Mr. Mustafa Şeker delivered a speech at the introduction ceremony of the KGK by expressing their pride, as the procurement authority, in participating in the promotional meeting of such an important project and he stated the following regarding the launch of mass production of the KGK: "We are proud to cater to our country with this product that we have been striving to procure abroad. For years, we have been involved in multiple procurement negotiations. We occasionally achieved a timely purchase, but at times we were given a late delivery plan."

Stating that this project gathered the institutes, R&D companies and Defense Industry companies, Mr. Şeker added: "We often have difficulties in the transition process from design to production. Today we are proud of having overcome all of these challenges. With this success that we have achieved here, I expect we can also perform successfully in our future projects."

TÜBİTAK President Prof. Arif Ergin: "This will be a project where Turkey's Strength is appreciated"

TÜBİTAK President Prof. Arif Ergin stated that the weapon system developed with national potential will reduce the foreign dependency of the Turkish Armed Forces. With the abilities of the Turkish defense industry this project will be an important impetus for other nationalization efforts carried out in the defense industry.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Prof. Ergin also underlined that the test-fires were made for entry into the inventory within the scope of the program and tests were completed with minimal need for preproduction.

Prof. Ergin noted that, as TÜBİTAK SAGE, they contributed to the development of the defense industry with sub-contractors who will be involved in the production and said: "We leave behind the days when we said, 'Why can't we execute our own production?' We are now achieving this; we have the potential to also surpass these achievements. Not only TÜBITAK, but also our universities, industry, the Undersecretariat for Defense Industries and the Turkish Armed Forces have meaning in harmony. From now on, we possess ammunition that we introduce into the inventory. We are at a point between 6 and 7 for our level of technological readiness as appraised by the Undersecretariat for Defense Industry."

Emphasizing the importance of launching domestic products especially with military technologies, Prof Ergin said, "Many products in Turkey have been brought to the forefront with technology development by TÜBITAK, but unfortunately we were not able to achieve the same success in the sense of converting them into commercial value in the market. We also haven't created a significant reputation in the international arena either. We must criticize ourselves here. We are not at a satisfactory level regarding the mass production of SOM missiles. We have lost a lot of time between the process of inventory acceptance and mass production. In light of the experiences we've gained in this area, we are concentrating efforts on not repeating the same mistakes. In the near future we will bear witness to the successful utilization of these munitions."


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Prof. Arif Ergin- TÜBiTAK President

The Design and Production of Critical Subsystems Used in Wing-Assisted Guidance Kit also Realized by TÜBİTAK SAGE with Local Resources

KGK is a wing-assisted guidance kit that converts existing unguided 1000 lb MK-83 and 500 lb MK-82 general purpose bombs into long-range, air-to-ground smart weapons. Through KGK, the bombs have the capability of a precision hit with up to a 10m error from a range of 110 km, under all weather conditions. This provides aircraft the ability to complete missions safely without getting closer to threatening zones.

KGK strikes the target with high precision using GPS/ING capability. It is capable of reaching a maximum of 60nm when released from high altitudes and 20nm when released from low altitudes.

In addition to the successful completion of the design, integration and production of KGK systems, TÜBİTAK SAGE also realized the design and production of various critical subsystems such as thermal batteries and some pyrotechnic components used in the KGK with national facilities and at its own facilities.

Ares Shipyard- World's Greatest Composite Hull Ship Manufacturer- Early Delivers the Multi-Role Patrol Crafts to Qatari Coast Guard Command

Within the scope of Turkey's greatest military vessel export contract so far, the off-shore patrol vessel and fast patrol boat project, 48m length Ares 150 Hercules (QC901) and 34m length Ares 110 Hercules (QC812) were delivered to the representatives of the Qatari Ministry of Interior at the handover ceremony held at the Ares Shipyard's premises in Antalya. The contract was signed in 2014 and procured by the Coast Guard Command of Qatar which is under the Qatari Ministry of Interior

Minister of Transport, Maritime Affairs and Communication Mr. Ahmet Arslan, Mayor of Antalya Mr. Münir Kaloğlu, Qatar's Deputy Minister of Interior Major General Al-Khulaifi, Commander of Qatar's Coast Guard Brigadier General Al-Mannai, Ares Shipyard's Chairman Mr. Kerim Kalafatoğlu, Deputy Undersecretary for Defense Industries Mr. Serdar Demirel and many invitees attended the handover ceremony taking place at Ares Shipyard's premises at the Antalya Free Zone. Accompanied by the Qatar's state representatives, the Minister of Transport, Maritime Affairs and Communication Mr. Ahmet Arslan and the accompanying delegation examined both the off-shore patrol vessel and the fast patrol boat before the ceremony. Following the examinations, Minister Mr. Arslan and the accompanying delegation headed to the location of the handover ceremony.

Taking the floor for the opening remarks and addressing participants, Deputy General Manager for Business Development at Ares Shipyard Mr. Utku Alanç mentioned that Ares Shipyard commenced its operations in 2006 with manufacturing small pleasure crafts and leisure boats, and with the experiences they gained in aluminum builds, steel and composite hull ships they specialized in building military, paramilitary and workboats. Underlining that with this decision of strategic change they adopted, they aimed to become an international defense industry company owing to the their human resources, organization management, integrated logistical support, quality management and developed production technologies, Mr. Alanç added, "The investments we made produced results within a short time. Mostly exports, we accomplished sales of over 100 boats to Naval Forces Commands, Coast Guard Commands, Maritime Police, Port Security and Customs Enforcement Directorates of various countries. Throughout this period, being accredited by the Ministry of Defense as a NATO Reference Supplier and National Secret Level Security Clearance, military vessel production permit and ISO-9001 14001 and 18001 quality management system certificates, our Shipyard continued to support the Turkish Armed Forces and Coast Guard Commands in national military projects as well. In line with this strategy, our number of staff increased each day and reached 300. Moreover, we launched internal design and R&D departments at our Shipyard. Presently, we are conducting our services in Antalya at 4 air-conditioned production facilities with approximately 22.000m² of indoor area, metal composite and carpentry workshops, paint drying ovens, training classrooms and modern office areas. We aim to increase our indoor manufacturing area to 30.000m² with the infrastructure investments planned for 2018".

Mr. Utku Alanç- Deputy General Manager for Business Development at Ares Shipyard

Ares Deputy General Manager Mr. Utku Alanç: "According to the Turkish Union of Chambers and Exchange Commodities' country wide assessment, Ares Shipyard became Turkey's fastest growing company in the year 2017"

Emphasizing on Ares Shipyard's investments and export achievements Mr. Alanç said, "So far, in addition to the requirements of the

Mr. Kerim Kalafatoğlu- Ares Shipyard Chairman and Executive Director

Coast Guard Commands of Turkey and Turkish Republic of Northern Cyprus; Qatar, Bahrain, Nigeria, Georgia, Tanzania and Turkmenistan are amongst the countries we export military and paramilitary vessels to. As a result of these sales, that are mostly composed of exports; within the scope of the assessment made countrywide by the Turkish Union of Chambers of Exchange Commodities in January 2017, we became Turkey's most rapidly growing company with a growth rate of over 4000%. We especially made our mark with the investments we made on infrastructure, personnel, R&D and production technologies and with the Ares Hercules series Patrol Boats project. We left many major worldwide shipyards behind in the international platform. Today, being Turkey's greatest military vessel exporter, Ares is at the same time Europe's greatest composite hull ship manufacturer and the world's biggest composite hull patrol craft producer. We are the only shipyard with the capacity to build military vessels with full production fusion technology and epoxy resin utilization."

Informing participants on the tender processes and the program model built as part of the requirement of the Qatar Ministry of Interior's Coast Guard Command, Mr. Alanç continued, "In this tender we left 18 major worldwide companies behind. We built the most optimum solutions in three different sizes and configurations by mutually negotiating the customer's tactical and operational requirements with the end user. As part of the project, five 24 m length, ten 34 m length fast patrol boats and two 48 m length off-shore patrol boats' design and manufacturing decision was agreed and on 14 April 2014 the contract was signed by the parties. Following the completion of the project's design stage, in order to verify the design prior to the production stage; the behavior analysis of the boats under various sea conditions and speeds through the scaled model tests was made and the output collected here were shared with the Qatar's Ministry of Interior, thus the production was launched after becoming sure of all capabilities of the boats. Although the foreseen project schedule in accordance with the contract terms points to 4.5 years, our Shipyard is operating 1.5 years ahead of this duration."

Mr. Kerim Kalafatoğlu present a plaque to Brigadier General Al-Mannai

Chairman and Executive Director at Ares Mr. Kerim Kalafatoğlu: "We reached the competence to provide technology transfer in Advanced Composite and Aluminum Hull Ship production"

Ares Shipyard Chairman and Executive Director Mr. Kerim Kalafatoğlu expressed that they worked very hard and proceeded greatly during the eleven years since their establishment and thanked his siblings Mr. Mert Kalafatoğlu, Ms. Yonca Kotiloğlu and Mr. Ersan Kotiloğlu for their tremendous efforts and added: "As of today, Ares shipyard broke the export record of the history of the Republic and became the greatest vessel exporter. When Turkey's average export per kilogram was $3, the export of the vessels delivered within this project was $152 per kilogram. The yearly average production of the shipyards active in the production of the vessels in this class and yachts in this segment is for instance in Netherlands 9.4 vessels. Unfortunately, in Turkey this average

The Commander of Qatar's Coast Guard Brigadier General Al-Mannai

is 2.6 vessels. In 2017 our shipyard folded Turkey's average over four times, exceeding Europe's average and it achieved the production and delivery of 11 ships. We reached the capacity of providng know-how in advanced composite and aluminum hull vessel manufacturing. In the upcoming days we will be giving good news that will make our country even more proud. Hereby, I would like to thank Qatar's Ministry of Interior for their trust in assigning us their project as well as their support."

Commander of Qatar's Coast Guard Brigadier General Al-Mannai stated that this program was one of the successful strategic partnerships of the alliance between Turkey and Qatar and stated that the project, as a result of the strategic cooperation between the two countries, contained military boats with very superior technology and competitive prices. Al-Mannai thanked those who contributed to the project, representatives of the Ares Shipyard being in the first place and the governments and defense ministries of the two countries.

Deputy Minister of Interior of Qatar, Major General Al-Khulaifi expressed the happiness he had for being there and added: "In 2002 when I was assigned as the Qatar

Mr. Kerim Kalafatoğlu; Major General Al-Khulaifi - Deputy Minister of Interior of Qatar,

Mr. Ahmet Arslan- Minister of Transport, Maritime Affairs and Communication

Coast Guard Command's Director, we planned to establish a new fleet for our coast guard command. I was assigned in different tasks in the following years and retiring before realizing this dream may be disappointing but now in 2017 we witness that we achieved this plan, this dream. We received 13 boats as part of the project and we will be taking the remaining four boats to Doha soon. I would like to thank once more the Turkish and Qatari governments for all their support."

Minister of Transport, Maritime Affairs and Communication Mr. Ahmet Arslan: "I observed that the delivered boats are at the quality of Mega Yachts. I would like to once more congratulate Ares Shipyard for these high-quality boats"

Minister of Transport, Maritime Affairs and Communication Mr. Ahmet Arslan stated that manufacturing multiple vessels in the same series was possible, yet building vessels in various categories simultaneously and reaching the committed figures were a great success and congratulated Ares Shipyard.

Mr. Arslan underlined the fact that Turkey now became a country capable of designing and manufacturing its own vessels and added that the foreign dependency in this area decreased. Arslan expressed that critical investments were made in the maritime industry in the last 15 years and continued, "The investments we made in maritime industry in the last 15 years increased to $2.8 billion and the number of shipyards increased to 79 from 37. Approximately 30 thousand people are employed at this sector and when we include the sub industries then over 90 thousand people should be working. The yearly turnover of the industry, excluding maintenance - repair and export, is $2.5 billion and the annual steel processing capacity is around the level of 700 thousand, therefore we are among the world's leading manufacturers. Moreover, Turkey remains ranking third on the list of worldwide mega yacht production. I would like to say that during our inspections prior to the handover ceremony, we observed that the military boats delivered are at the quality of mega yachts and I would like to congratulate Ares Shipyard again for building such a high quality and luxurious Patrol Boat. We wish that this capacity would not be limited merely with Qatar and that new projects at the same quality would be conducted with different countries as well."

Qatar Coast Guard Command - Ares Hercules Series

As part of the project, five "Ares 75 Hercules" fast patrol boats, which are the smallest members of the Hercules series Patrol Crafts, were built and the delivery of these boats was launched in 2016. All the boats were commissioned by the Qatari Coast Guard Command in the beginning of 2017. With 40 sea miles of maximum speed capacity and 360 sea miles of endurance "Ares 75 Hercules" patrol craft has electro optical sensors against asymmetrical threats and 12.7 mm STAMP Remote Controlled Stabilized Weapon System (RCWS) manufactured by Aselsan.

Ten 34m length "Ares 110 Hercules" Fast Patrol Vessels, selected as the world's best patrol vessel in 2016, were planned to be built and during the period from the beginning of 2016 until the end of 2017, total of 7 "Ares 110 Hercules" were delivered to the Qatar's Coast Guard Command. Over "Ares 110 Hercules" with 32 sea miles of maximum speed and 800 sea miles of endurance,

there are electro optical sensors to be used against conventional and asymmetrical threats as well as Aselsan production 30 mm "Muhafız" Remote Controlled Stabilized Artillery and two 12.7mm STAMP RCWS. Moreover, on "Ares 110 Hercules" a 7.5 m length Ares Harpoon Fast Intervention Boat remains for the deployment of SAT teams and fast intervention purposes.

"Ares 150 Hercules" is the largest member of the Hercules series multi-role patrol craft project and has the greatest composite hull ever built in Turkey. It is at the same time the fastest off-shore patrol vessel. "Ares 150 Hercules" has 48m length, 37 sea miles of maximum speed and 1600 sea miles of endurance. Against the conventional and asymmetrical threats, electro optical systems and Aselsan production 30mm "Muhafız" Remote Controlled Stabilized Artillery system and two 12.7 mm STAMP RCWS are mounted over the vessel. Similar to the 34m length configuration, this configuration has two 7.5m Ares 24 Harpoon Fast Intervention Boats for the deployment of SAT teams and immediate intervention. "Ares 150 Hercules" owns operational capabilities up to 6 sea states and stands out as one of the most superior platforms in its class with the speed values 20% over the criteria stipulated by the contract and its superior rotating capability of a radius of 74m and maneuver capabilities.

Ares Shipyard - 20 Months ahead of the Project Schedule

In accordance with the requirements of the Qatar's Ministry of Interior, the contract of which was signed at the DIMDEX 2014 fair held in Qatar in March 2014 included the procurement of 17 Coast Guard Boats composed of five 24m length, ten 34m length and two 48m length boats and the training of operators and maintenance staff on the vessels. Within the scope of the contract, the production, installation, test and acceptance processes of all vessels and their delivery to the Ministry of Interior of Qatar were planned to be completed within 56 months.

Of the high-speed vessels designed with advanced composite material to date, 13 boats consisted of five 24m length "Ares 75 Hercules", seven 34m length "Ares 110 Hercules" and one 48m length "Ares 150 Hercules" were delivered to the Qatar's Ministry of Interior. The construction activities of the one 48m Off-Shore Patrol Vessel continue at the shipyard, remaining three 34m "Ares 110 Hercules" Fast Patrol Boats are planned to be delivered earlier to the procurement authority. While all the procurement period was aimed to be accomplished within 56 months according to the terms of the contract, thanks to Ares Shipyard's robust supply chain and program management, the deliveries are proceeding 20 months ahead of the project schedule. Unless any delays occur, all boats are planned to be delivered in the first quarter of 2018 and thus the project would be completed 1.5 year earlier than the expected closing date

Vitrociset Moving Forward with Determined Business Development in Turkey

High business volume from Vitrociset's Ankara office anticipates a move from a branch office to a full Turkish Company. An Exclusive interview with Mr. Giovanni Ucella - Director, Ankara Office - Vitrociset

Defence Turkey: First of all, could you please inform us about Vitrociset's structure, capabilities and products?

Yes, thanks. Vitrociset is a Company mainly based in Italy and with subsidiaries and plants in France, Holland, Germany, Kenya, Malaysia and last but not least, here in Turkey. We are a "Problem Solution Company", and the vision of Vitrociset is to provide the know-how and capability to understand Customer needs, translate them into requirements and then into final solutions.

We mainly operate in Defense, Security, Space, Transportation and Government and Industries arenas.

Just to mention some of our products and solutions, we designed, produced and actually operate the VEGA Space Launching System in Korou (France Guyana) and the Italian Space Base in Malindi (Kenya), we designed and operate the Italian Weapon Test Range in Salto di Quirra (Italy), we also designed one of the largest European Live and Simulated Training Center and many other systems visible on our website, of course.

Korou and Salto di Quirra have been visited by SSM, Tur MoD, TGS, TuRAF, Roketsan and TÜBİTAK, and we are very proud of this Turkish interest in us.

Defence Turkey: You have an office in Ankara. What was your vision to establish an office in Ankara? What is your Ankara office mission and activities?

We established a simple Liaison Office five years ago that soon became a Branch due the volume of the business signed in the country. It is not a secret that in a while we want progress from a Branch to a full Turkish Company.

We operate both local contracts with my team of highly skilled Turkish engineers, and support Roma H.Q. to develops other contracts. The

business model of Vitrociset Turkey naturally follows the general ones of Vitrociset S.p.A., meaning that we always try to cooperate with National companies offering our solution for their programs as well as opening our market to their solutions.

We cooperate with many Turkish Companies and Agencies, ranging from the big ones to SMIs. Personally, I try to maintain a large networking base because I strongly believe that we have to know and trust each other if we want to create long lasting win-win opportunities.

Defence Turkey: Could you please enlighten us about Vitrociset's activities, the programs and projects that you carried out in Turkey?

Definitely, Roketsan is our main customer in Turkey and we are very proud to have been cooperating for many years with a such an important Company. We delivered a Digital Acquisition System to test the engine and because of our

long lasting experience with the Weapon Test Range we have been selected as main subcontractor in their Karapinar Test Range Modernization program; we design and are delivering, together with the Roketsan Team, a very complex Command and Control, Three Mobile Optical System and integrating the rest of the system. We also won two other tenders providing a Mobile C2 in two shelters and adding new functions to the Karapinar Site. We are also a consultant of Roketsan in their National Space Program. Another big customer for us is Leonardo, and there is an overall synergy rising worldwide between the two Italian Companies. Our Turkish Team is supporting Leonardo in maintaining and developing new functions in the SMART National Air Traffic Program in Ankara, Istanbul, Antalya, Dalaman, Bodrum, Izmir and Ercan. In Ankara Esenboga and Istanbul Ataturk we installed the ARTAS tracking System under a Eurocontrol tender. We also support Leonardo in the modernization of the NATO LIP Long Range Radar. A Vitrociset Turkish Team is collaborating with Telespazio for the Ground System within the Gokturk-1 program and we are also very proud to be consultants of Tubitak SAGE with whom we signed a Memorandum of Understanding during the last IDEF 2017.

Defence Turkey: It is well known that Vitrociset has cooperated with Turkish companies over the years, such as Roketsan. Could you please inform us about your cooperation with Turkish companies?

Yes, as mentioned before we cooperate with Roketsan in some of their important programs but we are also in touch with almost all other Turkish Army Force Foundation Companies as well as with TÜBİTAK SAGE. Moreover, we work on many opportunities with selected Turkish SMIs that can help us to penetrate the local market, and we always offer to them a transfer of technology and some opportunities to work for us in our market. Among others I should mention our strict cooperation with BITES for SW and SAVIS for HW and logistic.

Defence Turkey: Do you have any upcoming plans to export to 3rd countries with Turkish companies?

Why only 3rd countries? Also in Italy, NATO, EDA and the European Space Agency.

We are running some opportunities as a prime contractor having Turkish Companies as our partner. Those opportunities are Commercially Sensitive if not Classified so I cannot give more details. On the other hand, we hope that those Turkish Companies will consider Vitrociset as a good partner when working not only in Turkey but also in related, connected countries.

Defence Turkey: Vitrociset has capabilities in Space as well. Could you please inform us about your activities in this field? Could "Space" be considered a mutual area between Vitrociset and Turkish defense companies?

We are heavily involved in the Ground Segment of Space. We are not involved in launching rockets, satellite or payloads but we are one of the few worldwide companies with proven experience in global design, producing and operating a launching base system having VEGA in Korou as our main asset. We also work for the Italian and European Space Agencies, for Soyuz and Arianne.

We are not in competition with the Turkish Companies involved in Space such as Roketsan, Aselsan, TAI etc. but we can offer to them our experience in the Ground Segment as well and we can support them in participating

in the European Space Agency programs. Turkey is not yet in this agency but Turkish Companies might gain access to the agency's program as our subcontractor. Once again, we are looking on a win-win approach.

Defence Turkey: What are Vitrociset's R&D activities, capabilities and plans?

We have a network of R&D Centers, some are in Italy but also in France, Holland and Germany. Not yet in Turkey. Mainly we work in R&D for the Italian Authorities, Europe program, NATO, European Space Agency, Italian Space Agency and EDA.

Our vision is to move some of those programs to Turkey to be developed by a Turkish team and naturally accessing the R&D benefits of the "Invest in Turkey" program. So, we have to create an R&D Center here in Ankara.

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

I think that our business vision fits somehow with Defence Turkey's vision, as both are oriented to an international audience mainly based in Turkey. I strongly believe that the readers of Defence Turkey are the perfect Stakeholders of Vitrociset Turkey sharing same business vision. Thank you for this interview, you are always welcomed

Mr. Giovanni Ucella - Director, Ankara Office – Vitrociset; Mrs. Ayşe Evers – Editor in Chief of Defence Turkey Magazine

Otokar Submitted Proposal for Serial Production of "Altay" MBT

Otokar submitted its proposal to the Undersecretariat for Defense Industries for the serial production of the main battle tank Altay, which the company designed and has produced prototypes.

Otokar, a Koç Group company, submitted its proposal for serial production of the main battle tank Altay to the Undersecretariat for Defense Industries within the scope of the "Modern Tank Production Project by using National Sources". Otokar was chosen as the main contractor in 2008 for Altay's design, prototyping and qualification process, referred to as Phase 1. The qualification and acceptance tests of the prototypes produced in the first phase were successfully completed, and the prototypes were approved in February 2017. Meanwhile, the inspection and approval process of the Technical Data Package (TDP) by the Undersecretariat for Defense Industries is ongoing.

Otokar General Manager Mr. Serdar Görgüç commented on the serial production of Altay: "With over 50 years of experience and capabilities, Otokar has completed all the tasks it has undertaken with flying colors. We successfully designed and developed Altay, the national main battle tank for which we were the main contractor in Phase 1. With the investments that we made in this process, the experience we've gained, and the enhanced R&D capabilities, Otokar has captured strategic momentum in its position in the defense industry. As Turkey's leading land defense systems company, with all the competencies required to produce the Altay, and also strengthening the national defense industry's capabilities, we are up to the task. Our wish is for the main battle tank Altay to start serving the Turkish Armed Forces as early as possible."


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New Generation Main Battle Tank "Altay"

Designed and developed to meet the requirements and expectations of the Turkish Land Forces against present and future threats, with its specifications Altay is the world's most modern main battle tank. The main battle tank, distinctive with its increased survivability, mobility and firing power, has delivered superior performance in challenging tests conducted in all climatic and terrain conditions for the last two years. Altay achieved very high accuracy results in firing tests carried out for diverse scenarios in all types of climate conditions and distances.

Otokar has already worked on all the infrastructure requirements and has planned for the production lines to be prepared to launch production as early as possible upon the signing of the agreement for Altay's serial production, and has obtained the necessary Manufacturing Permit from the Ministry of Defense. In addition to planning for the production of the 250 units of the main battle tank Altay that the Land Forces requires over the course of five years.

The Undersecretariat for Defense Industries released the Call to Bid Document in July for Altay's 'Serial Production' work and 'Integrated Logistics Support' services.


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STM "ThinkTech" – Turkey's first Technology - Oriented Think Tank Launched in Ankara

Launch of Turkey's first technology oriented think tank 'ThinkTech' was realized by STM with the participation of 300 distinguished guest on 23 November 2017 during the panel titled "The Priority Defense Systems and Technologies of the Operation Environment of the Future"

The opening speech of the panel was addressed by the General Manager of STM Davut Yılmaz, and Undersecretary for Defense Industries Prof. İsmail Demir, Retired Ambassador Mr. Sönmez Köksal, Retired Lieutenant General Alpaslan Erdoğan and Faculty Member at the International Relations Department of METU Prof. Hüseyin Bağcı gathered at the panel. "The Priority Defense Systems and Technologies of the Operation Environment of the Future" panel was moderated by the journalist Mr. Hakan Çelik.

STM General Manager Mr. Davut Yılmaz stated that Turkey always need to build optimal solutions due to the geographical risks and problems it faces and added: "Being powerful and remaining powerful is not easy for a country. In order to achieve this, the main components building national power that are economic, political, military and geographical factors, there is a necessity to be more superior both within themselves and in total and a need to remain as such. In order to maintain this, long term strategies and reactive and particularly proactive approaches that will facilitate these strategies are required. In order to provide such approaches, rational arguments based on concrete and data based arguments and analyses must be presented. We are aware that the think-tanks in Turkey are active in social, cultural or geographical issues and that they generate ideas in those areas. However, a structure focusing merely on defense and security does not exist in our country. Our founding mission is set as a consultancy company. Within the framework of these basic missions, we decided to pursue a company structure. Defense and security will lie in the foundation of this structure, yet we aim to form a mechanism that embraces these areas along with all other areas within a whole."

STM General Manager Mr. Davut Yılmaz: "With STM's "ThinkTech", We Aim to fill a Critical Gap in Turkey"

Stating that they will focus on three areas of activity similar with other examples in the world, Mr. Yılmaz said: "We will be publishing periodical reports each month containing more technical issues based on defense and security areas that are our primary main theme; we will be conducting analyses and sharing them directly with the public opinion. In this respect we will have an area of activity that will specifically include the relevant institutions. Within the scope of this area of activity, there will be special simulations, analyses and implementations for the companies and institutions. Actually, we have launched two applications in this way. We have been executing one of these applications jointly with SETA which is the most significant ThinkTech foundation of our country and we will announce this with SETA when the time and place are ripe. Another activity we will conduct to this end will be the meetings based on the main theme of defense and security such as this panel we will accomplish today. We will be holding some of these open to the public such as this one we are holding today, and some will be restricted with the participation of the relevant institutions. I believe that this development will fill a

Mr. Davut Yılmaz - General Manager of STM

crucial gap in our country and we wish that this new mechanism will bring good luck to our defense industry and to our country."

Following the opening remarks, the panel titled as the "Priority Defense Systems and Technologies of the Operation Environment of the Future" moderated by journalist Mr. Hakan Çelik started with the participation of the Undersecretary for Defense Industries Prof. İsmail Demir, Retired Ambassador Mr. Sönmez Köksal, Retired Lieutenant General Alpaslan Erdoğan and Faculty Member at the International Relations Department of METU Prof. Hüseyin Bağcı.

Taking the floor as the first panelist, Undersecretary for Defense Industries Prof. İsmail Demir stressed that the decision-making mechanisms need to be fed with data and added that the availability of these mechanisms for the operation environment of the future was of vital importance. "While fulfilling the today's operational requirements we also have to prepare ourselves for the future, identify the potential areas that would create difference and canalize our activities towards them. If we manage to obtain results from the data through big data analysis, we will be able to witness the evolution occurring in command control processes within the operation environment of the future. As a result of the analyses such as the rapidly changing environmental conditions, climate change, and the biological changes of the human beings, a quite different operation plan might be built related with the operation environment of the future. We have to assess altogether the concepts that emerge today as social engineering as a consequence of data analysis. If we intend to adopt a powerful position in the operation environment of the future with all its aspects, we seriously have to add social engineering to the physical concept of combat readiness. Population and urbanization are increasing each day. The certain parts of countries' most

fertile lands are excluded from production with the expansion of cities. On the other hand, there exist demographic structural changes due to border security issues and the increasing number of immigrants, which bring along issues such as security, food, clothing, accommodation, energy, water, education and health. Additionally, migration waves emerging in the world affect both domestic and international powers and cause power struggles and sources of terrorism caused by these factors in our present agenda. If we are speaking of a theory, we need to benefit from the analysis of human psychology and social engineering in order to figure out how these guided people are guided. We should keep in mind that social media is used extensively and that the ways of influencing people are analyzed comprehensively. As a result of the incidents that we encounter, we are able to perceive that people are easily misguided in an atmosphere where people believe that they are able to think independently," said Prof.Demir.

Undersecretary for Defense Industries Prof. Demir: "Power Generation and Energy Storage will be one of the Game Changing Parameters in the Operation Environment of the Future"

Moreover, touching upon the importance of power generation and energy storage, Prof. Demir said, "Today we are still discussing conventional methods regarding energy. We need game changer insights and resources regarding energy. We believe that energy storage is quite crucial in respect to this issue. One of the most critical impacts of the operation environment will be the storage and transfer of power that will be employed on electronic and electromagnetic systems. When speaking of robotic systems, unmanned and smart systems, we should bear in mind that remote control systems might be a game changer concept."

Mentioning that the selection of material is a component that creates a difference in the balance of power, Prof. Demir said, "We are speaking of a wide chain extending from the nano-level to high strength, durable material. We need to estimate that materials capable of operating under various circumstances in space will frequently arise in the upcoming future."

Stating that the rate of local participation in the Turkish

Prof. İsmail Demir – Undersecretary for Defense Industries

Defense Industry increased to the level of 60%-65%, Prof. Demir added, "We strive to accomplish certain achievements in almost all of the technological components I mentioned just before. Yet, we cannot claim that these efforts are sufficient. We cannot attain different results through conducting similar processes. We need to revise our methods of combining technology with our educational system and academic life. We have to achieve certain things in a different way and we should especially avoid neglecting basic science."

Retired Ambassador Mr. Sönmez Köksal: "The margin between War and Peace Started to Shrink"

Taking the floor at the panel, Retired Ambassador Mr. Sönmez Köksal stated that the technology oriented think tank "ThinkTech" will be filling a critical gap in Turkey and continued, "The balance of power in the world changes constantly, when we take a look at the perspective of the years 2030-2040, certain technical and scientific developments that would turn the defense and security equation upside down will be in question. Turkey needs to peruse these changes carefully because any misconduct at that point would crucially damage our country. This structure formed under the auspices of respectable institutions such as the Undersecretariat for Defense Industries and STM must correctly comprehend this mathematical and rational thinking system within the framework of Turkey's principles and unique circumstances in order to adopt the proper decisions."

Expressing that the power balances between America, Russia, European Union and China revealed certain strategic study areas, Mr. Köksal added, "Space, cyber and marine transportation areas will start to gain more importance within these study areas. Threats have started to become more individual with the developments especially in the cyber security area. The threats created by such isolated individuals start to become more dimensiontional. developments such as nano-technology, biotechnology, artificial intelligence and the internet of things do not exist merely under the state monopoly, as such there are also techniques and scientific research developed by the private sector. Therefore, the access of individuals and certain sub groups to such data will start to become more accessible. The margin between war and peace will start to shrink."

Retired Lieutenant General Alparslan Erdoğan touched upon the impossibility of an operation environment without space systems in our times and underlined the importance of spear-heading the journey in time in order to acquire the technologies of the future through analyzing the technological concepts that penetrate all aspects of life in recent years. Mr. Erdoğan added, "The technological importance of invisible technology, artificial intelligence, armed UAV systems, Unmanned Land Vehicles and laser technologies will progressively increase. Moreover, in my opinion strategic steps in electronic warfare area should be taken as well."

Underlining that "ThinkTech" concept has been a requirement for Turkey, Faculty Member of the International Relations Department of METU Prof. Hüseyin Bağcı added that competent and experienced staff from our home and abroad should exist in the Executive Board of ThinkTech and continued: "The person to be in charge of the think tank should be far away from politics and not be a typical academician. Instead, he should be a scientist with in-depth knowledge of international communications."

Prof. Bağcı stated that one of the most critical responsibilities of the think tank would be establishing a data bank through coalescing all the academic areas such as mathematics and physics.

"ThinkTech" Center to Publish Technology-Oriented Analyses and Reports in Aviation, Energy, Transportation, Education and Health Areas Apart from Defense and Security

STM will be developing regional and global strategies, technological forecasts, potential scenarios and decision support systems with its know-how and human resources experienced in defense - security and engineering - technology with "ThinkTech". Offering ideological and practical contributions applicable to Turkey's future vision, ThinkTech will be developing unique solutions through technology based analyses with an objective and constructive approach mainly in defense - security and engineering - technology, and also in aviation, energy, transportation, education and health and will publish reports with the help of its data processing capacity

FNSS Pars 8x8 WACV Accomplished Firing Tests in Oman

On November 22nd, 2017, the firing activities were successfully performed for the Pars 8x8 Wheeled Armored Combat Vehicle at the firing and testing range of the Royal Land Forces in Nizva - Oman

Pars 8x8, which has newly joined the force inventory, showed off its maneuverability in difficult terrain conditions firing against different target types during the activity with the participation of Commander of the Oman Land Forces and senior commanders. Fixed and moving targets between the ranges of 100 m and 2500m were successfully destroyed by firing from the moving vehicle.

The Commander of the Oman Land Forces and the accompanying delegation examined the vehicles and obtained information from the project officers during the activity.

Within the scope of the contract, 13 configurations totaling 172 6×6 and 8×8 armored vehicles are planned to be manufactured for the requirements of the Oman Armed Forces.

Pars III 8x8 Features and Outstanding Capabilities

Pars III 8x8 is the new generation of the wheeled armored combat vehicle (WACV) designed and developed by FNSS Savunma Sistemleri A.Ş. Pars III 8x8 has been developed with a special emphasis on mobility, protection, payload and growth potential. The vehicles employ the latest designs and technologies with a focus on performance and durability within modern military operational requirements. The vehicles are available in 4x4, 6x6 and 8x8 configurations. The Pars family of vehicles is named after the “Anatolian Leopard.”

The Pars III 8x8 combat weight is 30,000 kg and is powered by a diesel engine. The power pack consists of a water-cooled diesel engine, coupled with a fully automatic transmission which generates a maximum road speed of up to 100 km/h. Pars III 8x8 is capable of maneuvering on a 60% vertical and 30% horizontal gradient, climbing obstacles 70 cm-high and crossing 200 cm-wide trenches. Due to the engine layout and favored balanced design, the vehicle has almost equal axle loads. This design approach gives the vehicle the ability to move comfortably even on loose and soft terrain, providing increased road-holding at high speeds and short braking distances. The vehicle has 8x8 driving characteristics, and all of its axles can be locked when necessary. The central tire inflation system allows the driver to adjust the tire pressure and negotiate with different obstacles and terrain types.

Havelsan 3rd Business Ecosystem Gathering Held in Ankara

The 3rd Business Ecosystem Gathering hosted by Havelsan was held in Ankara with the theme 'Strong Cooperation for a Strong Turkey'. Numerous executives and representatives of the Major Industry companies, SMEs and Sub-Industry companies attended the event where presentations on Havelsan's business ecosystem and implementations of the company in procurement processes, KOSGEB (Small and Medium Enterprises Development Organization) Grants and Incentives, SSM (Undersecretariat for Defense Industries) EYDEP Project approaches and standby credits were shared with participants. After the presentations, the most successful suppliers from various categories were awarded. Following the lunch break, negotiations under many different titles were held with the suppliers at 26 tables within the framework of bilateral cooperation.

Havelsan General Manager Mr. Ahmet Hamdi Atalay: "One of our strategic targets as Havelsan is to transform our structure from a project oriented product approach to a structure having strategic products"

The opening speech of the 2nd Havelsan Business Ecosystem Gathering on 8 December 2017 at the Bilkent Hotel was delivered by Havelsan's General Manager Mr. Ahmet Hamdi Atalay. Noting that within the scope of the vision for 2023, they identified to create a Havelsan with a turnover of $1.5 billion that exists amongst the top 100 companies of the worldwide defense industry as a strategic target for themselves, Mr. Atalay added that while reaching that size, they planned to achieve 1/3 of their turnover from the defense industry, 1/3 from civilian activities and the remaining 1/3 from foreign sales.

Underlining that Havelsan has a project based operation, Mr. Atalay stated that they wished to transform their company from one that assumes and completes project based works into a company having strategic products and continued: "We endeavor to build our technology and product management system while creating our business ecosystem. Since we operate on project basis, we deliver the products we developed to our customer as part of the project. Each time we repeatedly conducted the similar activities yet we never had an off-the-shelf product, now we are turning the output we have here into commercial products, we will have these products at our shelves and we will be gathering these products in projects, we will configure them in accordance with the requirements and introduce them to our customers in that way. Therefore, we adopted a strategic target that will turn us into a product company from a product-project company. Again, for supporting the aforesaid strategy, we adopted another strategy that is developing indigenous, domestic and national technologies that reduce the foreign dependency."

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Stating that one of their strategic targets is to increase foreign sales, Mr. Atalay stated that they aimed to become a global company and that they were taking long term steps to that end. Mr. Atalay: "We intend to become a regional power and we took concrete steps towards this direction. There are important business opportunities especially in the Gulf Countries, there are businesses we accomplished in addition to some contracts we already signed and ones we are about to sign. We opened our office in Qatar and we are about to complete the official establishment process of the company there. We also conduct the preparations for opening offices in Kuwait and Saudi Arabia in addition to Pakistan. Therefore, I can say that we are proceeding towards becoming a well-known technology company in our region."

Havelsan General Manager Mr. Ahmet Hamdi Atalay: "As Havelsan we expect our business partners to develop themselves in specific areas."

Mr. Atalay underlined that Havelsan aimed to grow with its shareholders instead of an organic growth and added, "Our other strategic target is to grow inorganically with our shareholders within our business ecosystem while we achieve all our other targets. What we refer to as our business ecosystem is the one composed of our business partners and Havelsan exists at the very center of this structure surrounded by the aforesaid business partners. This ecosystem operates in the following way; the candidate business partner companies reach us through various channels (telephone e-mail, etc.). We hold introductory activities regarding our company for them and companies visit and give details on their own capabilities. Then they enter their

information via the internet to our business ecosystem and make applications. After that we procure a service from an audit company and these applicants are audited. The audit company submits us a report upon theirs visits and we classify our companies in accordance with this report into A, B, C and D categories. In the aftermath, we make a second visit as Havelsan. We conduct on-site audits to observe the level of the capabilities and competence of the companies with the potential for cooperation. Then, when there is a need, we request an offer from these companies registered to our ecosystem. The mechanism operates in this way. Afterwards, we evaluate the price, quality, service speed and delivery duration criteria and performances of the companies we collaborate with. As a result of these assessments, the performance scores of the companies are calculated. In this way, we build the A, B, C, D categories. From now on, as we will be holding the very first ceremony for it this year, we aim to award the most successful companies at the end of the year. Up to date, we accomplished various businesses with approximately 1000 companies from our business ecosystem. There are 275 companies which we may refer to as business partners, registered to our system. As Havelsan, our growth is directly proportional with the growth of our business partners, therefore we ask these companies to select a specific area for themselves."

Havelsan General Manager Mr. Ahmet Hamdi Atalay stressed that the Quantum 3D company they bought in America last year started its operations and gave an important message to the shareholders of the industry. Atalay said, "This Company is a crucial opportunity for all companies in our ecosystem, mainly for our foundation companies wishing to operate in America. Hereby I would like to address all our shareholders. If you wish to take part in such markets and if you have the sufficient capability, then our doors are always open to you."

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Prof. Cevahir Uzkurt- the President of KOSGEB

KOSGEB President Prof. Cevahir Uzkurt: "Regarding SME incentives, we are building a product based, project based, company based private support mechanisms instead of a classical method."

Addressing the participants at the opening ceremony President of KOSGEB Prof. Cevahir Uzkurt mentioned that, supporting an ecosystem based on the cooperation of the focus points lied within the scope of KOSGEB's vision for the future and continued, "We launched two new support programs as part of this vision. Within this framework, we signed a cooperation protocol as the main contractor with the Undersecretariat for Defense Industries, and our companies such as Havelsan and Aselsan. So far we have supported our SMEs in many ways and areas. And we will continue to support them; however, in our following attempts for building new support models, we will endeavor to provide rather product based, project based, company based, and industry based supports instead of the classical support mechanisms. As KOSGEB, the companies to which we will provide support have to be in the scale of SMEs. Yet I believe that if you are to support the SMEs in the current economic system, proceeding merely with the SMEs would not be quite rational as most of the SME companies are conducting their production activities for the major companies based on their requests. Even if, as KOSGEB, we would not provide support to major companies still we absolutely wish the Main Contractors to be in this scenario. We advise the following to the main contractors. You identify the SMEs with the technological capabilities and competencies sufficient for manufacturing the technological products you require or the main products we import; sign initial contracts with these SMEs, build cooperation and apply to KOSGEB; and thus, we will create various support models in line with your requirements and demands."

Prof. Cevahir Uzkurt: "We support the high-end technology products with completed R&D studies and that become prototypes up to the limit of 5 million TL."

Prof. Uzkurt shared the details of the support packages they prepared with the participants and said, "We named one of the two support programs I mentioned earlier as the strategic product support program. Here, we want the byproducts or final products we import to be with a high level of technology, medium-high technology and especially in manufacturing industry. In the event that these products are manufactured in Turkey by our

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domestic and national companies, we will be providing a support up to 5 million Turkish Liras (est. $1.31 million). A part of this support program that could be supported 100% is composed of machinery and equipment expenditure and software expenses.

In my opinion, the cooperation built within this ecosystem would be benefiting to a large extent from this program. On one hand, we built a support program regarding the intermediate products we import and on the other hand we reinforced particularly the R&D centers as well as the R&D and technology development phases of the business through technology development zones until now. In this sense, we will be providing support up to 5 million TL (we are also authorized to double the support if the product in question is a critical one) again with the same model to our companies manufacturing a technological prototype available for production with completed R&D studies and that is supported both by the government and international funds. We named it as the SME Support Investment Program."

Havelsan Deputy General Manager in Charge of Operations Mr. Cenk Özen: "We assigned contracts worth 71 million TL in 2017 to our business partners in our business ecosystem."

Mr. Cenk Özen – Deputy General Manager in charge of Operations at Havelsan

Deputy General Manager in charge of Operations at Havelsan Mr. Cenk Özen made a presentation on Havelsan's business ecosystem and procurement process implementations. Telling that they aimed to decrease the expenses, time and risks they assumed through the ecosystem they built, Mr. Özen added that they intended to increase their performance as well as the satisfaction of their customers with the effective utilization of this business ecosystem and relayed information to the participants on their activities in the 11-month period of 2017. Mr. Özen: "As of today, 490 companies are registered to our ecosystem, the companies selling us products to which we refer as suppliers are not included in this figure. We have audited 286 companies so far. If we take a look at the results of the audits, the companies in group A consist 6% of our total companies and similarly the ratio of group D is around this level, group B and C constitute the most of this percentage. Within 2017, in this 11-month period we accomplished a total of 83 tenders covering our business ecosystem and from 280 companies we requested 874 proposals with a contract price of 71 million TL (est. $18 million). 10% of these proposals were from group A, 50% from group B and 40% from group C. When we analyze our companies that did not respond to the request, we observed that most of them were conducting activities aside the areas they declared and therefore did not submit any proposals. This causes a severe loss of time. Therefore, we kindly ask our business partners to fill the information regarding their companies in a more earnest fashion at our business ecosystem portal."

Stating that they expected the companies within the business ecosystem to become competent in certain areas, Mr. Özen added that the companies increasing their capabilities in specific areas would be standing out in the next period. Sharing their goals towards the business ecosystem in 2018 with the participants Mr. Özen said, "We will have a financing support agreement with Akbank. We will be conducting trainings to be funded by Havelsan in order to create awareness in quality management with our business partners. Besides we will be holding meetings for informing our business partners. Our 'academy days' meetings will be available to our business partners as well."

Mr. Ahmet Dursunoğlu, Head of the KOSGEB Technology and Innovation Support Mechanisms

Sharing essential information on KOSGEB Grants and Incentives - Defense Industry Special Support Program to the participants Mr. Ahmet Dursunoğlu, Head of the KOSGEB Technology and Innovation Support Mechanisms mentioned that KOSGEB issued two more new support programs in accordance with its strategic action plan and continued: "With the technologic product support program and strategic product support program, we created crucial incentives for the nationalization of the critical products that bear critical importance especially regarding the main industry and sub industry cooperation and for the realization of the required investments. Through our strategic product support program we aim to increase the domestic input, indigenization and nationalization of the strategic products that are highly imported. With this support, we plan to extend the high technology, the operation of our SMEs and major industry companies in harmony while contributing to the reduction of

the current deficit. Here we have three main models. Our Small Sized SMEs could apply to our organization individually. According to the second model, our SME companies will be able to apply to our organization with a preliminary contract they signed with a company of a larger scale. And finally in the last model, multiple SMEs could bring their projects to our organization by gathering with a major business. We request the applicant companies to have at least 1 year of business experience."

The Competency Inventory of the Industry being created with EYDEP Program

Presenting on behalf of the Industrialization Department at the Undersecretariat for Defense Industries, Electronics and Software Sector Manager Mr. Evren Yücel stated that as the Undersecretariat they built an industrialization portal and added that up to date 625 companies have registered into this portal. Mr. Yücel: "We have 2919 products designed and manufactured by Turkish companies in the industrialization portal. Moreover, we launched the Industrial Competency Evaluation and Support Program (EYDEP) eight months ago. There are thousands of SMEs in Turkey. What we want to know is, which technologies won? From where did they get the support? We are launching a new period with the EYDEP. The activities we held as part of EYDEP up to date were as follows: We examined the industrial assessment processes, developed question sets and conducted certain pilot implementations. An assessment pool was created with the participation of all foundation companies and several private sector companies and we received training from them. The implementation as part of this EYDEP program proceeds as follows: We have an application and the evaluation request may either come from you or from us. We say let's include this company to the EYDEP evaluation process. First of all let's register it to our portal, then send the company our preliminary question sets and then visit the company for assessment and prepare a report. The point here is to see whether the company is institutional and to observe its technical capabilities. So we wish to report such points. If the number of companies in a certain area is higher than it should be, then we aim to direct them towards the areas we will be identifying. If the process is planned well and if we manage to direct our companies well, then a company within the C or D category in the initial assessment could be elevated with our support. We need to position our companies well in the industrialization period."

Havelsan and Akbank have signed a financing support agreement

Following the presentations, the Supplier Award Ceremony was held. This year, for the first time, the award for the longest standing cooperation, performance development award, competitive approach award, technology development award, qualified cooperation development award and promising technology company award were delivered by Havelsan.

The awarded categories and companies are as follows:

Qualified Cooperation Development Award: Simsoft and Siren Bilişim

Technology Development Award: Yepsan, Infodif Yazılım, Aeroteam Yazılım

Performance Development Award: MilSOFT

Most Long Standing Cooperation Award: BİTES

Competitive Approach Award: Ante Grup Elektrik-Elektronik Bilişim

Promising Technology Company Award: X-Sinerji Technology Services

Moreover, Supplier Financing Cooperation Protocol was signed between Havelsan and Akbank at the event. During the second half of the gathering, cooperation meetings with the suppliers were held under different titles consisting of a total of 26 tables

Simsoft Company has achieved Qualified Cooperation Development Award

Multi-Role Vessel (MRV) - Modern and Progressive Solution that Exceeds the Capabilities of a Corvette

Austal has been at the forefront of high speed aluminum shipbuilding for three decades. From our origins in the commercial fast ferry industry, we are among the pioneers of large vessels capable of moving people, vehicles and equipment at high speed. We are constantly reviewing trends and opportunities and innovating vessel design, construction and sustainment. In the global defense market, we see many countries with common maritime security challenges including long coastlines, irregular arrivals of people by small boats, and a need for counter-terror, counter trafficking and other border protection activities. Turkey's strategic location at the crossroads of Europe and Asia has seen a number of regional security challenges that cross into the maritime domain. However, Turkey has a vibrant and capable naval shipbuilding industry and therefore we are looking at niches where our innovative products can differentiate themselves. We see opportunities in both the larger high speed patrol vessels, and also in high speed logistics vessels.

Austal has an intrinsic understanding of aluminum and its outstanding capabilities as a construction material. We developed highly specialized, proprietary process to design and construct vessels with optimal strength and minimal weight. Our "Finite Element Structural Analysis" allows for an optimal design solution to be developed based on the customer operating requirements.

Elaborating on the company's defense product portfolio, this article will focus on the 80 metre Multi-Role Vessel (or 'MRV'). This vessel can be compared and contrasted to a Corvette in terms of capabilities and performance (Austal have also designed similar MRV's from 56 to 90m). The global interest in multi-mission warships is growing – all Navy's must seek to maximise value for money, minimise risk and have a flexible fleet for the spectrum of modern naval missions.

The Austal Multi-Role Vessel (MRV) is a modern and progressive solution that exceeds the capabilities of a Corvette; it has a long range, is high speed and multi mission ready. Austal has been refining the MRV concept, based on the company's proven trimaran hull platform now in service with the US Navy's Independence Variant Littoral Combat Ship. As the largest aluminium ship builders in the world and an experienced Defence Prime Contractor, Austal has significant experience in the design, construction and provision of Integrated Logistic Support to a range of Navy and Coast Guards.

The trimaran design is effectively a stabilised monohull and comprises one long slender hull in the centre and two side supporting hulls - delivering superior performance in sea keeping and significant space for accommodating mission modules, weapons and sensors.

The MRV is incredibly flexible and has a proven low risk pedigree. The ship can be deployed to patrol Exclusive Economic Zone (EEZ), execute Task Force Level Command and Control, complete surveillance and search and rescue missions as well as amphibious operations and humanitarian aid missions. The 500sqm mission bay is ideal to support specialist attachments (such as special forces, mine warfare drones, hydrographic surveys, etc).

The vessel can be deployed in offshore and littoral warfare environments or in support of long range counter-terrorism and piracy interdiction operations. The United States Navy have been using the larger (Austal design and built) Independence variant Littoral Combat Ship for anti-submarine warfare (ASW), escort duties and are continuing to explore the vessel capabilities, globally.

The 80 meter MRV Trimaran Design and Features

The Austal MRV 80 has Corvette warfighting capability as well as being able to accommodate ISO packaged mission modules. The MRV can execute warship vessel duties and offers many enhanced capabilities.

The key advantages of the Austal MRV over a conventional Corvette include:

Mission bay

The enormous mission / logistics bay provides 500 square meters with a clear height of 4 meters (equivalent to 2.5 tennis courts). It is designed to accommodate cargo, equipment and military vehicles – it is this large, versatile mission bay that sets MRV the apart from conventional Corvettes. This can be configured for a range of missions:

- Special Forces boats, swimmer deliver vehicles and mine counter measure drones can all be stored, launched and recovered (up to 12.0 tones).
- Anti-Submarine Warfare towed arrays and other modular packages can be positioned over the stern.
- Tracked or wheeled vehicles can be embarked via the folding ramp.
- Aft crane enables movement between flight deck (290sqm) and the mission bay

Multi-hull Deadweight for Ship Length

The MRV design uses Austal's patented trimaran technology, delivering fuel efficiency with low deadweight and high internal volume within modest ship length. Aluminum vessels' comparable lightness can equate to a 20-30% fuel saving over a similar steel hulled vessel – a significant through life saving in operating costs.

Draft and maneuverability

The shallow draft of the MRV's trimaran hull allows access to a wide range of ports and affords high maneuverability even within constrained waters.

Speed

The long slender multi-hull configuration offers significant savings in resistance to a monohull design of similar same length; achieving high speed with less power to conventional monohull, steel vessels. The MRV delivers high speed without high fuel costs.

Signature management

The trimaran hull MRV is shaped to incorporate Stealth lines. The low superstructure reduces Radar Cross Section (RCS), while in-tunnel exhaust reduces infrared signature, shock mounting and acoustic signature management can be discussed in detailed design phase.

Austal's larger Littoral Combat Ship (Independence variant LCS), in service with the U.S Navy have passed three (3) US Navy physical shock trials in July 2016. This is the first time that an all-aluminum vessel has been through shock trials. The trials check the performance of the vessel when there is an underwater explosion, such as a torpedo or mine. It's the first time that the US Navy has shock trialed any vessel since 2008. Independence variant Littoral Combat Ship USS Jackson (LCS 6) completing the first of three full-ship shock trials. (U.S. Navy photo). The trimaran hull MRV is based on this proven, tested design.

Stability and performance

The trimaran exhibits considerably better stability

This comparison illustrates - the MRV is available in various configurations as per user requirements.

characteristics than a monohull. The peak in the righting lever curve for the trimaran is typically at a 15° to 20° greater heel angle than for an equivalent catamaran. The reserve buoyancy in the outer hulls above the design waterline allows the righting lever of the trimaran to dramatically increase as the vessel heels. The speed loss typically experienced during operation in head seas is not as apparent with the trimaran configuration due to reduced wave impacts and slamming when compared with an equivalent monohull.

Ship Motions

Monohull designs are susceptible to roll which adversely effects passenger comfort / crew effectiveness. The trimaran stability characteristics allows for a long, slow and very comfortable roll characteristic. Proven in both commercial and defense operation, the trimaran offers high speeds and slower roll. The direct correlation between ship motion and crew mission effectiveness is well understood – the Austal MRV seakeeping ensure crews are fighting the mission not fighting the sea conditions.

Configuration

The 80m MRV overall length is 80 meters, beam of 21.1 meters and a draft of 3.2 meters. The dead-weight of the vessel is 400 tones. The ship complement is 35, with 87 berths for mission crew. Significantly, the ship's permanent crew may be augmented by mission crew – depending on the task and skill set required; this reflects the modular approach to embarking systems and missions as required.

There is a full CIC, briefing rooms and spaces for embarked staff. The volume of internal space achieved in a trimaran is at the core of the flexibility, comfort and value for money unique to the MRV. The flight deck area is 290 square meters; capable of supporting a Black Hawk S-70 or similar medium sized helicopter with a hanger and helicopter control station. The specific mission bay doors, ramps, overhead gantry and other systems can be tailored to suit national preferences.

Defense Prime Contractor

Austal are an experience Defense Prime contractor as illustrated in Table A – Austal recent and ongoing Defense Programs.

Vessel		Client	Deliveries	Details
	58m Cape Class Patrol Boat (CCPB)	Royal Australian Navy (RAN) and Australian Border Force (ABF)	8 vessels delivered to ABF from 2013-2015 and 2 vessels delivered to the RAN in 2017.	Aluminum monohulls designed for range, endurance and flexibility in responding to maritime security threats.
	127m Littoral Combat Ship (LCS)	United States Navy (USN)	6 vessels delivered to the USN from 2009-2017. 5 further vessels currently under construction and another 4 scheduled.	The Independence variant of the LCS Class is a high speed, agile, shallow draft and networked surface ship designed to defeat littoral threats.
	103m Expeditionary Transport Vessel (EPF)	United States Navy (USN)	9 vessels delivered to the USN from 2012-2017. 3 further vessels currently under construction.	High-speed transport vessels for the US Army and the US Navy, used for fast intra-theater transportation of troops, military vehicles and equipment.
	72m High Speed Support Vessel (HSSV)	Royal Oman Navy (RNO)	2 vessels delivered to the RNO in 2016.	The High-Speed Support Vessel (HSSV) is a multi-mission theatre support solution based on Austal's proven high speed catamaran platform.
	39.5m 'Guardian Class' Pacific Patrol Boat (PPB)	Australian Commonwealth Government	1 vessel under construction and a further 20 scheduled under a continuous production plan.	Steel monohull vessels designed for sovereignty patrols. End users include Papua New Guinea, Fiji, Federated States of Micronesia, Tonga, Solomon Islands, Cook Islands, Kiribati, Marshall Islands, Palau, Samoa, Tuvalu, Vanuatu and Timor-Leste.

Table A – Austal recent and ongoing Defense Programs

Through this global experience Austal understands the requirements to integrate local Original Equipment Manufacturers (OEM) components, equipment and systems. Main guns, combat management systems, close-in-weapon systems, remote weapon stations and all the C4I networks are open to client preferences.

The MRV can be adapted for Vertical Launch ESSM, 57 or 76mm gun, Revolving Airframe Missile (RAM), and various gun Remote Weapon Stations (RWS).

Propulsion is by three MTU 20V 4000 diesel engines - driving three fixed pitch propellers. Each engine will deliver a power an output of 4,300kW at 2,170rpm. The propulsion system will provide a maximum speed of 26kt and a range of 4,500nm at 12kt with an endurance of 28 days. Additional speed can be achieved with alternate configurations – for example, the LCS has Gas Turbines and waterjets propulsion.

Innovation and Technology

Austal are open to Transfer of Technology (TOT) under various national requirements. The United States Navy LCS is an example of Austal completing defense TOT. The revolutionary ship design was Australian based. With investment, local contractor engagement, training and equipment – the Austal facility in Mobile Alabama is now in continuous production for two innovative classes of US Navy ships and has grown to become the 4th largest shipyard in the USA, employing over 4,000 people.

Mobile, Alabama – the home of Austal USA and production facility for LCS and EPF

Austal can provide a similar TOT project model, scalable to conditions and requirements of the local market. We are cooperating with a major local shipyard in Turkey and have signed an MoU in 2017. We are looking for long-term relations where Austal can share its competitive advantage.

The Austal ongoing investment in Research and Development (R&D) and culture of embracing lessons learnt leads directly to continuous improvement. Deliveries to more than 55 countries and many repeat clients illustrate Austal's ability to provide technologically advanced vessels that are well priced and a valuable fleet asset.

Austal innovation includes ship operating systems – MARINELINK Smart is a whole of ship management system for engineering, firefighting, remote control and reporting of various operating systems. This commercially proven system provides real time data for engineering – key to efficient maintenance practices.

The Austal LCS is under innovation too – based on the proven Independence-variant platform Austal's proposed Frigate (FFG-X) solution for the US Navy possesses increased lethality with an addition of a number of enhanced combat systems. Retaining the LCS's high-speed, shallow draft and multi-mission capabilities, the Austal Frigate (FFG-X) is designed to meet and exceed US Navy requirements and offers a cost effective yet powerful combatant solution.

Conclusion

The Austal MRV is an advanced, next generation warship. The weapons and sensors are appropriate to many Corvette applications – the large flight deck, hangar and force multiplier mission bay are true revolutions. The trimaran hull provides enormous internal space for vehicles, SF detachments, ISO containers, towed arrays and any combination of mission packages – operational planning and deployment flexibility is unparalleled against comparable monohulls.

The Austal experience in defense Prime contracting, aluminum construction and multihull vessels drives down risk. Proven ability in Transfer of Technology and OEM engagement ensures maximum local industry engagement. The Austal MRV is a major step forward from traditional monohull steel vessels – providing greater, innovative Navy capability for a modern fleet.

New Developments in High Speed Imaging to Aid Aerospace Testing

By Doreen Clark, Senior Product Manager, Vision Research

Comprehensively testing designs in aerospace can be complex and difficult. High speed imaging lends a helping hand to understand the dynamics of designs, providing valuable information that may be otherwise difficult or impossible to gather. However, high speed imaging has its own inherent issues – it can require incredible amounts of light, can generate large amounts of data, and can incorporate trade-offs in camera size or features, for example, to achieve core frame rate and image quality capabilities.

Vision Research, designer and manufacturer of Phantom cameras, has introduced cameras and features to help address issues found in high speed imaging, making the technology more useful for the demanding testing needs found in aerospace.

Ultra-High-Speed 1Mpx family for ultimate speeds

Vision Research introduced the Phantom Ultra High Speed (UHS) family of cameras in 2013 and has since revised the platform twice to offer increased capability. The latest version has throughputs of up to 25Gpx/sec, or 25,000 frames per second (fps) at full 1 Megapixel resolution of 1280 x 800. At reduced resolutions, the cameras can achieve up to 663,250 fps, or up to 1 Million fps with the export-controlled FAST option. If an application requires a frame rate of 200,000 fps, for example, a UHS camera can provide resolution up to 360 x 200 pixels to capture more of the event. The family has four cameras offering four levels of throughput performance ranging from 12 Gpx/sec throughput to 25 Gpx/sec throughput. Researchers can buy the level of performance they need immediately, and upgrade to higher performance if the need arises in the future.

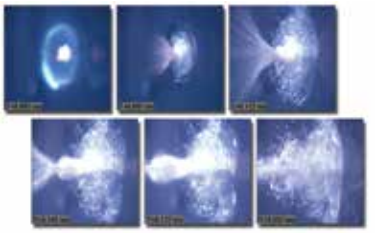
A challenge many high-speed imaging applications face is that as frame rates increase, they require significantly more light to see the image, although in many cases it is difficult to add more light. Therefore a high speed camera's light sensitivity is very important, and the Phantom Ultra-High-Speed cameras were

Phantom v2512 Ultra High-Speed camera

designed with maximum light sensitivity, achieving ISO ratings of 32,000D (monochrome) and 6,400D (color).

Supporting the NASA Hypervelocity Lab

Phantom Ultra High Speed (UHS) cameras support many important aerospace and defense applications, such as the testing conducted at NASA's Remote Hypervelocity Test Laboratory. The lab simulates the effect debris has on space equipment and space suits. To closely simulate the speed debris travels in orbit, the lab fires projectiles constructed of aluminum, nylon, and stainless steel at speeds over 25,700 km/hour, more than six times faster than a rifle bullet. The speed of impact is significantly faster than the human eye can see, so to record and analyze the impact the team uses high speed cameras. They incorporated a Phantom V2512 from the Ultra High-Speed family not only to leverage the camera's 25 Gpx/sec throughput, but also its high light sensitivity. The camera was able to capture shock waves in an impact as well as other phenomena in a low light experiments, helping the team specifically determine the improvements that were needed in space craft and spacesuits, and their components.



Sequence of images from a hypervelocity impact

Introducing the V2040/ v2640 4Mpx Cameras for Ultimate Image Quality

In the beginning of 2018, Vision Research is introducing the Phantom v2040/v2640, a 4Mpx Ultra High-Speed camera built on the same platform as its 1Mpx cameras, to support applications that require very high image quality and detail. The v2460 provides exceptional image quality for more accurate analysis and flexibility to accommodate multiple requirements. It can achieve up to 26 Gpx/sec throughput, or 6,500 fps at full 4Mpx resolution of 2048 x 1952.

Image quality: The v2640 offers very high image quality for a clearer image and better analysis. It performs CDS directly on the sensor, providing a very high dynamic range of 63dB and very low noise of 7.4 e-. A high dynamic range provides more levels of variation in an image's tones, so that more detail can be distinguished especially in the very dark and very light regions of an image. Low noise equates to a cleaner image, allowing the small details of an experiment to be more visible and not obscured by flecks or spots in the image. While performing CDS, the camera achieves a throughput of up to 20 Gpx/sec. Additionally, it has an ISO rating of 16,000D (Monochrome), and 3,200D (Color), the highest ratings in the industry for a multi-megapixel high-speed camera. Combined, these attributes give researchers who need high resolution, high-speed imaging a cleaner, more detailed image for analysis. The low noise benefit is most evident in the dark regions of an image, which are often the most difficult to analyze.

Flexibility: The v2640 sensor is also equipped with a non-CDS mode (HS mode), to provide up to 34% higher throughput to achieve 26 Gpx/sec. It may also employ 2x2 Binning on Monochrome cameras in either CDS mode or HS mode. Binning converts the camera into a 1 Mpx camera with increased light sensitivity and throughput. For applications that require extremely low exposure times, an Export-controlled Fast option can be applied to both the CDS and HS modes, reaching as low as 500 ns in

New Phantom v2640 Mpx camera

CDS mode and 150 ns in HS mode. All modes are selectable in software, and may be purchased according to need. Combined, these modes provide significant flexibility to accomplish a wide range of applications. No other sensor offers as many modes and thus, as much flexibility.

Programmable I/O: To increase flexibility in testing and experiments, the v2640 incorporates an internal pulse processor which supports programmable I/O, giving the ability to assign and define signals to manage camera activity. Signals that can be modified include F-Sync, Strobe, Event, Pre-trigger, Memgate, Timecode-out, Ready, Aux, and Auto-trigger. In most cases the signal polarity, delay, pulse width and edge (rising or falling) can be set according to the needs of the application and interfacing equipment. The ability to assign and define signals allows the camera to accommodate an application workflow more readily, giving ultimate camera control and flexibility.

Flex 4k -GS: Often, the observation of fine details from a distance requires high resolution. For example, seeing detailed shockwave movement from afar is a phenomenon that aerospace researchers typically require. In response to this need, the Phantom Flex4K-GS camera has been developed. This modification of the well-known and highly acclaimed 4K resolution media camera means that research and development now has access to image quality not previously available. The key component is the switch from a rolling shutter (low noise, improved visual quality for cinema) to a global shutter. A global shutter, allows researchers to observe quickly moving and rotating events without producing classic rolling shutter image artifacts (e.g. the bending of helicopter rotor blades). Like the media camera, the Flex4K-GS will deliver 1,000 fps at 4K resolution (4096 x 2304), 1900 at 2K resolution (2048 x 1152), and 2930 fps at 1280 x 720.

Miro N-series: The Aerospace industry is heavily influenced by structural size requirements for a variety of projects. For this reason, the tiny Phantom N-Series is the best option for recording hard-to-access events. At just over a 1-inch cube (32mm x 32mm x 29mm) this camera can fit in the smallest spaces and still deliver quality images to researchers. At full resolution (768x600), this tiny, but powerful device can deliver 560 fps and can reach over 9,000 fps at lower resolutions. Another benefit of the N-Series setup is that the camera head is attached to a base at the end of a long cable. Using CoaXPress (CXP) the protocol ensures that every image is safely stored away from the camera head. In potentially destructive environments, this means that the all required data and images are safe if the head is destroyed. The camera head is easily replaceable in the field and does not require lengthy downtime.

Features for Ease-of-Use

Often scientists and researchers are experts in their field of study, but don't have time to become experts in high speed imaging. Incorporating high speed cameras as a tool in research has its own challenges, so Phantom cameras have features to help alleviate those challenges.

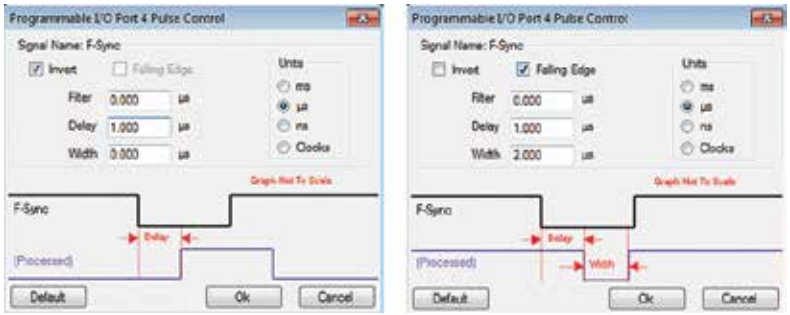
Data Management: As a high speed generates a large amount of data, the UHS cameras can be equipped with up to 288GB of RAM and have 10G Ethernet as standard. 10Gb Ethernet provides up to 500 MB/second download speed to an optimized system, significantly reducing download time compares to 1Gb Ethernet. They also have an option for up to 2TB removable CineMag media. These features provide researchers quick data downloading options for easier data management and faster results.

Exposure Index: High speed applications are light starved. The higher the frame rate, the more additional light is required, so a camera's light sensitivity, typically reported as its ISO rating, is important. The sensitivity is a derivative of the sensor design and processing. In addition to the native sensitivity, post image processing can be applied through software to lighten images. However, post image processing can be time consuming, and too much processing can add noise and lose detail in the image, rendering it less useful. Exposure Index, available in almost all Phantom high speed cameras, helps alleviate that. Following the same concept found in many DSLR cameras, Phantom cameras have eight preset options to lighten an image while adding minimal noise. The options are based on adjustments of an image's tone curve, rather than gain or gamma, and applies to both monochrome and color images. The example below shows the Ultrahigh-speed v2512, operating at 99,000 frames per second, with the lowest Exposure Index of 8000 and the highest of 40,000.

The Exposure Index can be selected during camera set-up, making it easier to compensate for light.

About Vision Research:

Vision Research designs and produces a broad range of high speed cameras to fit scientific, academic, and cinematic applications. For more information, visit www.phantomhighspeed.com.



Graphic representation of signal behavior is displayed in Phantom Camera Control Software

TÜRKSAT 5A & 5B Satellites to be Manufactured by Airbus

A contract for two new generation communications satellites was signed by TÜRKSAT with Airbus Defense and Space on 11th November

The satellites, TÜRKSAT 5A and TÜRKSAT 5B, are based on the latest Electric Orbit Raising (EOR) version of Airbus' highly reliable Eurostar E3000 platform, which uses electric propulsion for in-orbit raising and station-keeping. "We are very pleased to welcome TÜRKSAT as a new Eurostar customer for the most powerful satellites of their fleet. We were the first to demonstrate full electric propulsion technology for satellites of this size and capacity, and this will enable the TÜRKSAT spacecraft to be launched in the most cost-efficient manner," said Mr. Nicolas Chamussy, Head of Space Systems at Airbus.

TÜRKSAT 5A is a broadcast satellite which will operate in Ku-band at the 31⁰ East longitude slot in geostationary orbit, covering Turkey, the Middle East, Europe, North Africa and South Africa. The spacecraft will have a launch mass of 3,500 kg and electrical power of 12 kW. It is planned for in-orbit delivery in 2020.

TÜRKSAT 5B is a broadband satellite which will operate in Ku- and Ka-bands at the 42⁰ East longitude slot in geostationary orbit. Its HTS (High Throughput Satellite) payload will provide more than 50 Gbps of capacity over a wide coverage including Turkey, the Middle East and large regions of Africa. The spacecraft will have a launch mass of 4,500 kg and electrical power of 15 kW. It is planned for in-orbit delivery in 2021.

The satellites will be built by Airbus in its UK and French facilities, with valuable Turkish contribution. Both satellites are planned for a service lifetime largely in excess of 15 years. TÜRKSAT 5A and TÜRKSAT 5B are the 57th and 58th Eurostar E3000 satellites ordered, and the 7th and 8th in the Eurostar E3000e version, which recently completed the fastest electric orbit raising ever from transfer to geostationary orbit.

OKIS Tested with Bayraktar TB2

OKIS was developed and tested for the first time in the Bayraktar TB2 UAV System which was developed and manufactured uniquely by Baykar. The Bayraktar TB2 UAV System has been utilized operationally for 3 years by the Turkish Armed Forces. The automatic take-off and landing system provides precise positioning data to the landing and take-off systems of unmanned air vehicles, by using radar technology. During the execution of the tests, communication between the OKIS Air Unit integrated to Bayraktar TB2 and the OKIS Ground Unit positioned at the side of the runway was achieved from a distance of 12 km. It was observed throughout the ground and air tests conducted with Bayraktar TB2 and OKIS that the position data generated was highly precise and this would enable automatic landing and take-off capacities to the platform independent from the global positioning system (GPS, Glonass, etc.)

OKIS is used for the redundant and secure take-off and landing for UAVs and is composed of two main units: the OKIS Air Unit containing the transponder and antenna over the UAVs and the OKIS Ground Unit including the mono-pulse radar positioned on the runway. Due to its small size and light weight, OKIS Air Unit can be utilized by almost all types of UAV systems without any significant impact on disposable load capacity.

OSSA Primed to Present Accomplishments at ICDDA in 2018, Turkey's World Class Defense and Aerospace Business Forum

The 4th ICDDA Defense and Aerospace Industry Cooperation Days will be held 23-25 October 2018 by the OSTİM Defense and Aviation Cluster Association (OSSA) at the Ankara Hacettepe Beytepe Congress Center, under the auspices of the Undersecretariat for Defense Industries. This event offers Defense and Aerospace companies the opportunity to further develop their existing business relationships, create new business relations, define problems and to shape potential solutions facing the industry

According to feedback and the results of surveys conducted after previous events, the ICDDA event proved that it achieved a 95% success rate on the suitability of companies that were matched for bilateral meetings, and according to the performance evaluation report it also received a 95% satisfaction rate in the selection and pairing of companies for the bilateral meetings.

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Mr. Mithat Ertuğ – The Chairman of the OSSA Cluster

The ICDDA organization offers SMEs that carry out activities in the Turkish Defense Industry an affordable opportunity to meet with high-profile national and international companies. Support provided by the Ministry of Economy under the scope of International Competition Development projects are also of great importance toward increasing the participation of SME companies in the event.

With international buyers and effective bilateral business negotiations, the ICDDA organization was deemed worthy of the Defense Industry Special Award in 2014 and the Defense Industry Promotion Special Award in 2017 by the Undersecretariat for Defense Industries.

On the first day of the three-day event, issues such as Civil Aviation, Naval-Air-Land Systems, Homeland Security Technologies and the Development of Supply Chain topics will be discussed in various panels moderated by leading local and foreign experts. The problems and possible solutions faced by the companies in the sector will be open for discussion during the event. Representatives of public and private sectors as well as universities will be in attendance as well. On the 2nd and 3rd days of the event, bilateral business negotiations will be organized, bringing participants together with national and international key players.

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Over 200 companies from 33 countries participated in the 3rd event that was held in October 2016 and a total of 5,400 registered bilateral business meetings were held during the 3-day event. Various international companies such as Airbus Defense and Space, Boeing, BAE Systems, Dassault Systems, Leonardo, Lockheed Martin, MBDA, Navantia, Rolls-Royce, Sikorsky and Thales participated in the event. In addition, Aselsan, Havelsan, TAI, TEI, FNNS, Otokar, Roketsan and MKEK were main contractor companies that participated in the event from Turkey.


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SAHA Members Become Boeing Suppliers

Boeing-SAHA Cooperation will introduce new companies to the Turkish Aerospace Industry. For more than a year SAHA Istanbul has been engaged in efforts to reach its goal of including companies from Turkey in the supplier list of Boeing - one of the world's largest producers of civilian-military aircrafts and helicopters. SAHA Istanbul members Yepsan, Gür Metal and Yüksel Kompozit will be amongst Boeing's approved suppliers

SAHA Istanbul Defense and Aerospace Cluster Association, which organized the "Boeing-SAHA Istanbul Aerospace Supplier Summit" last year has now started to realize the benefits of their dedicated efforts, accomplishing the inclusion of new companies from Turkey in Boeing's supplier list. Noting that 89 SAHA member companies made bilateral negotiations with Boeing in October 2016 and that they had the opportunity to introduce their skills and know-how to Boeing at the SAHA-Boeing meeting, SAHA Istanbul Secretary General Mr. İlhami Keleş said: "The efforts put forth in order for our companies to take part in the procurement processes have been brought to a successful conclusion and our members Yepsan, Gür Metal, Yüksel Kompozit were approved as Boeing suppliers".

Big Step for Turkish Aerospace Industry

The details recently announced regarding the collaboration that will take place within the scope of the Turkish National Aviation Plan are of great importance. The Turkish Aerospace Industry will be fortified within the framework of the strategic partnership established with Boeing.

The supplier agreements made with Boeing will contribute significantly to the development of Turkey's aerospace industry. Mr. Keleş remarked "In the conference, which was organized within the context of the Boeing Turkey National Aviation Plan and where the details of the Development Program of the Aerospace Industry in Turkey were explained, Boeing and the Undersecretariat for Defense Industries (SSM) officials described the supplier development program that was initiated by Boeing and the SSM. The course of action was explained as well as the integration plan for the 'Industrial Competence Assessment Project (EYDEP)'. The details of the new process were shared in the panels held during the conference. The process was launched to facilitate the procurement process and to ensure that SME-level companies are included in the supplier lists.

Boeing to Set up Liason Office at Istanbul Teknopark

During the conference Mr. İlhami Keleş reiterated that Boeing has requested the establishment of a supplier liaison office at Teknopark Istanbul to enable SAHA Istanbul and Boeing to work more closely together. He added: "During the talks, the EYDEP (Industrial Competence Assessment Project) activities of the companies in the Northern Marmara Region will be realized within SAHA Istanbul as SAHA EYDEP and for this reason it was emphasized that Boeing, for its studies in this region, needs work in closer proximity to SAHA Istanbul."

Mr. İlhami Keleş pointed out that important buyers, producers and suppliers both from Turkey and the world will meet up at the SAHA EXPO, which will be organized at the Istanbul Expo Center (İFM) between the 13th and the 15th of October 2018. "We look forward to the development of similar collaborations like these we achieved with Boeing today at the SAHA EXPO, where SAHA members will participate", said Mr. Keleş.

Mr. İlhami Keleş - General Secretary of SAHA Istanbul Defense & Aerospace Cluster

Chief Advisor of the Prime Ministry and the Founding Member of the Board of SAHA Istanbul Prof. Metin Yerebakan, Deputy Undersecretary for Defense Industries Dr. Celal Sami Tüfekçi, Deputy Undersecretary for Defense Industries Mr. Serdar Demirel, Head of Industrialization Department Mr. Bilal Aktaş, Head of Fixed-Wing Platforms Department Mr. Abdurrahman Şeref Can, TAI President Temel Kotil, Ph.D, Turkish Technic General Manager Mr. Ahmet Karaman, Kale Aerospace General Manager Mr. Latif Cengiz, TCI General Manager Mr. Çetin Tuğtağ, Boeing Turkey General Manager Ms. Ayşem Sargın Işıl and Boeing senior procurement officials attended the Aerospace Industry Development Program Opening Ceremony and Conference held at Swissôtel The Bosphorus Hotel in Istanbul under the auspices of the Undersecretariat for Defense Industries within the scope of the Boeing Turkish National Aviation Plan.

Boeing Turkey Supplier Development Program Launches in Istanbul with more than 100 Companies

Boeing launched the Turkey Supplier Development Program, one of the key components of the National Aviation Initiative, the scope of which was announced November 21, 2017, with the participation of Prof. Dr. İsmail Demir, Undersecretary of Defense Industries. It is a joint development by Boeing, its stakeholders and business partners to further develop Turkey's aviation and aerospace industry in conjunction with the country's Vision 2023 and with the objective of growing its aerospace industry.

The Opening Ceremony and Conference were held in Istanbul under the auspices of the Undersecretariat of Defense Industries (SSM), and with the participation of more than 100 companies on November 28.

Boeing aims to increase the Turkish industry's share of the global aerospace supply chain with this Supplier Development Program, launched for the first time in Turkey. Many representatives from companies that are not currently Boeing suppliers took part in the event alongside Boeing's numerous stakeholders and Tier 1 suppliers in Turkey.

Mr. Brian Baird, Vice President, Supply Chain Operations, Boeing Commercial Airplanes, explained the actions to be taken toward increasing Turkish industry's share of the Boeing supply chain. "We are pleased to launch today the Turkey Supplier Development Program in this high value-added and export-focused sector", he said. "With this program, we aim to increase the share of the Turkish aerospace industry in global supply chains, develop the number of competing companies and their global competitiveness."

"Turkey is among Boeing's priority markets, not only because it's a growing country, but also, it's a contributor to Boeing's competitiveness and productivity. The Turkish aerospace industry has world-class production capacity, engineers, pilots, and service and maintenance providers. That's why we created the National Aviation Initiative together with our stakeholders here to transform our collaboration with Turkey into a strategic partnership. One of the most important parts of this plan is industry collaboration". said Ms. Ayşem Sargın, Boeing Turkey General Manager and Country Executive.

Mr. Brian Baird, Vice President, Supply Chain Operations, Boeing Commercial Airplanes

Ms. Ayşem Sargın, Boeing Turkey General Manager and Country Executive

TAI – Istanbul Teknopark Center was Inaugurated

For conducting applied studies to increase the competitiveness of the products under company's areas of activity TAI opened its center at Teknopark Istanbul. At the center where the timely development of company's priority projects is aimed, engineers graduated from universities' engineering faculties will be employed. With this new center, achieving contribution to TAI's R&D and innovation studies and its ongoing projects is aimed.

In the opening ceremony of TAI Istanbul Teknopark center, which will operate at an area of 2,600 square meters, TAI's Chairman of the Board Prof. Oğuz Borat, TAI President and CEO Assoc. Prof. Temel Kotil and Teknopark İstanbul Manager Kemal Fidanboylu participated.

Wishing to increase its activities in R&D and innovation with the engineers at its Teknopark center, TAI has built a dynamic staff with the engineers graduating from Turkey's major universities. The majority of the staff is composed of design engineers graduated from


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reputable universities such as Yıldız Technical University, METU, Istanbul Technical University and Bilkent University.

METU and TAI Initiate the Very Light Aircraft Development Program

Turkish Aerospace Industries Inc. (TAI) and the Middle East Technical University (METU) signed a contract under the scope of the "Independent Research and Development (BARGE) Project for the Development of the Very Light Aircraft (VLA)" project. According to the initiated project, the design of the aircraft will be completed by METU students; the manufacturing, assembly, integration and test activities will be performed by TAI. In the ceremony held, the project contract was signed by the rector of METU Prof. Mustafa Birşan Kök and TAI President and CEO Assoc. Prof. Temel Kotil. Expressing his happiness for the project, Kotil said: "We attach great importance to our university partnerships to meet the engineering needs of the projects of the future. Through this project, first experiences will be acquired and expert young minds will be trained for the aviation activities in Turkey".

The project aims to promote the development of University and Industry Cooperation, as well as the training of engineering

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students to be employed in the Defense and Aviation sector in the fields of aircraft design, production, assembly, and ground and flight tests. The contract signed between TAI and METU will enable the students to start


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their design activities during their education and transform their designs into products. Therefore, the students will be encouraged also to pursue activities in the aviation sector through aircraft design.

Within the scope of the project, Istanbul Technical University (ITU) and Middle East Technical University were selected as the first pilot universities having faculties in the field of Aerospace and Aeronautics. In April, the same project was initiated with ITU.

Airbus Displayed a Comprehensive Range of Weapons for Armed C295 at Dubai Air Show

Roketsan`s Unique Designed Products, the L-UMTAS, "Cirit" Laser Guided Missile and the Teber-82 Laser Bomb Guidance Kit were on Display at the Dubai Air Show

Airbus Defense and Space showcased its new C295 Armed ISR (Intelligence Surveillance & Reconnaissance) version at the Dubai Airshow. The C295 was exhibited on static display flanked by a wide range of weapons which have been selected for integration onto this versatile platform.

The company has signed a series of agreements with air-to-surface weapon suppliers paving the way for flight-trials to qualify their products to equip the C295. Since the previously announced memorandum of understanding with Roketsan of Turkey, similar arrangements have been reached with Expal, Escribano and Equipaer of Spain, as well as Rheinmetall of Germany, and the US suppliers Nobles Worldwide and US Ordnance. Aircraft have already been delivered to an unidentified customer including two 12.7mm light machine guns and mounts, supplied by Nobles Worldwide and US Ordnance, to be mounted in the paratroop side doors.

The next weapon to undergo airborne carriage trials is planned to be Roketsan's L-UMTAS anti-tank missile. Roketsan is also providing the "Cirit" laser-guided missile and the Teber-82 laser bomb-guidance kit. Rheinmetall's BK 27 autocannon provides a heavier door-mounted option, targeted by Escribano's Door Gun System. Expal displayed its CAT-70 (2.75 inch) rockets and Mk 82 warhead, and Equipaer displayed its CAT 70 Multiple

Rocket Launcher at the exhibition.

Head of Military Aircraft Fernando Alonso said: "The development of further applications for the C295, as well as our other aircraft, is a key element of our strategy for the future. The remarkable flexibility designed into the C295 makes it a superb platform for a wide range of mission-specific configurations."

Aselsan Celebrates its 42nd Anniversary

Aselsan, the biggest company of the Turkish Defense Industry, visited Anıtkabir (the mausoleum of Mustafa Kemal Atatürk) with more than 5 thousand employees on its 42nd anniversary

Aselsan Chairman Prof. İbrahim Özkol, together with the directors and employees, stood in homage at Anıtkabir. After placing a wreath on the Great Leader Atatürk's mausoleum, Chairman Prof. Özkol signed the guest book at Anıtkabir.

Chairman Prof. İbrahim Özkol wrote the following in the special guest book: "Great Leader Atatürk,

we proudly stand up before you today that we celebrate the 42nd year of our foundation as the Aselsan Family. Established with the contributions of our supreme state and donators, Aselsan has reached the position of the largest 57th defense industry company in the world and being the most valuable company on the Istanbul Stock Exchange with more than 5 thousand employees. Aselsan, since its establishment, has been taking firm steps forward in the objective to be a national technology company which maintains its sustainable growth with the values it creates in global markets and is preferred by its competitive power, which is

trusted as a strategic partner and is environmentally and humanly sensitive. In the technology journey we proceeded to become the Aselsan of the Great Turkish Nation and the Turkish Army, 'Science is the most real mentor for everything in the world, for civilization, for success, for life.' May God bless your soul."

Mr. Fethi Azaklı Appointed as Havelsan's Chairman of the Board

Mr. Fethi Azaklı was appointed as the new Chairman of Havelsan's Board according to the decree adopted at the Board Meeting held on 8 December 2017. Prof. Mustafa Alkan was also appointed as the new board member.

Prof. Abdullah Çavuşoğlu had been appointed as the Chairman of the Board at the ordinary meeting of the general assembly held in March 2017. Upon this reassignment, Prof. Çavuşoğlu left his position to Mr. Fethi Azaklı after his short term of office.

Havelsan's New Board Members are as follows:

- Fethi Azaklı – Chairman
- Taner Düvenci - Vice Chairman
- Ahmet Akyol – Board Member
- Gökhan Gökay – Board Member
- Prof.Dr. Mustafa Alkan - Board Member

Biography of Fethi Azaklı

Mr. Fethi Azaklı was born in 1959 in Rize-İkizdere. He graduated from the Psychology Department of the Faculty of Educational Sciences of Ankara University in 1982 and Istanbul University's Faculty of Law in 1995.

Azaklı worked as an Education Specialist and Psychological Counsellor and in 1996 he launched his legal career by registering to the Istanbul Bar Association. He started to work at the Telecommunications

Mr. Fethi Azaklı

Communication Presidency (TİB) in 2009 and became the Head of the Legal Department of TIB. Then Azaklı served as the Presidency Counsellor at the Information Technologies and Communications Authority and took up a position as the Chairman of Havelsan's Executive Board on 8 December 2017.

Prof. Dr. Mustafa Alkan

Biography of Prof. Mustafa Alkan

Prof. Mustafa Alkan was born in 1962 in Kayseri-Develi. After he graduated from the Electronical Engineering Department of Erciyes University, Alkan started to work as a Research Assistant at the same university. Alkan completed his Master's and PhD degrees at the Electronical Engineering Department. Working at the Kayseri District Office of Turkish Standards Institute in 1988-1994, Alkan became an Associate Professor in 1998.

Serving as the Vice President of the Information Technologies and Communications Authority in 2001-2012, Alkan was assigned as a Professor at the Electrical and Electronical Engineering Department of the Faculty of Technology of Gazi University in 2012 and worked as the Department Head of the aforementioned department from 2012-2015.

Prof. Alkan was the Founder of the Council of Informatics of Turkey and Founder and President of the Information Security Association and has over 100 national and international publications.

Working actively in many projects as part of Turkey's e-transformation process, Alkan was appointed as the Board Member of Havelsan on 8 December 2017.

Aviation Systems Developed by Meteksan Defense Exported to a Far East Country

Meteksan Defense, one of the leading companies in the field of electronic systems of the Turkish defense and aerospace industries, has achieved one more export success with the national systems it has developed. Within the last month, a contract regarding the export of avionic systems developed by Meteksan Defense for air platforms was signed with a Far East country.

New Assignment in Onur A.Ş.

The position change in Onur A.Ş., which was established in 1980, was shared with the public with the statement made by the company. Cengiz Dede, the founder of the company and General Manager for 37 years, handed over his duties to his son Noyan Dede. Cengiz Dede, who has been the General Manager and the Chairman of the Board of Directors since 1980, will continue to serve as the Chairman of Board of Onur A.Ş. After the handover ceremony Cengiz Dede said, "With this assignment, I have made the necessary change at the right time so that the management of the company has been transferred to younger and more dynamic staff and that the companies can be long-lasting. I wish Noyan Dede, the new general manager of our company, and all the employees of our company success and I believe that our company, which has achieved remarkable successes for 37 years, will be much more successful after this change.

Biography of Noyan Burçin Dede - Onur A.Ş General Manager

He was born in Ankara in 1974. He completed his secondary education at Mimar Kemal Secondary School and high school education at Ankara Yüce Fen Lisesi (1988-1991). He studied at the Department of Mechanical Engineering at the University of Illinois, USA and graduated in 1996. He completed his MBA degree at Bilkent University in 1997.

Serving as the Deputy General Manager at Onur Mühendislik A.Ş since 1998, Noyan Burçin Dede was appointed as the General Manager in 2017.

Noyan Burçin Dede is married and has two children.

TAI Engages the Asian Market

TAI made its mark with its proven products at the Bangkok Defense & Security fair held in Thailand on 6-9 November 2017

Various institutions in the fields of defense and security as well as TAI Board of Directors and President Temel Kotil, Ph.D, attended the opening ceremony of the fair which was hosted by the Prime Minister of Thailand.

On the first day of the fair, important business negotiations were also held at the TAI stand, where the high-level delegation and visitors showed great interest. Ms. Evren Dağdelen Akgün, the Turkish Ambassador to Thailand, visited the TAI stand and obtained information about the ongoing projects in the region and in Thailand, sharing her views and evaluations. In addition, various negotiations were held to strengthen the commercial and military business alliance with the Armed Forces as well as defense companies of the Asian countries such as Singapore, Malaysia, South Korea, Philippines and Thailand.

"Anka" UAV and T129 "Atak" were TAI's most attention-grabbing products, with an aim to expand its commercial volume by introducing the "Hürkuş" New Generation Basic Trainer Aircraft, T129 "Atak" Helicopter, Turkish Fighter and "Anka" UAV platforms to the Asian market. The T129 "Atak" Helicopter also attracted the attention of global armies with its superior maneuverability. In this context, it was recorded that important negotiations were made with officials of the regional countries during the fair for the sale of the T129 "Atak" Helicopter. The exemplary T129 "Atak" is included in the inventory of the Turkish Armed Forces and has been proven in theatre; thus, the attention captured at this event and in the region, constitute important steps taken for the future of market expansion.

TAI and Russian IRKUT Corporation Signed Strategic Partnership at Dubai Air Show

TAI continues to make significant breakthroughs at the Dubai Air Show following the Thailand fair. TAI signed a strategic partnership with Russian firm IRKUT in Dubai.

TAI exhibited its products and capabilities at the Dubai Air Show, held in the United Arab Emirates on November 12-16, and continues to increase market efficiency in the Middle East. A high level of interest and participation was observed at the TAI chalet where the Deputy Chief of Staff of Pakistan and the Ambassador of Turkey to Abu Dhabi also visited. TAI President Temel Kotil reiterated that they have ambition for the defense and aerospace sectors also in the Gulf countries by emphasizing the importance of participation in the Dubai Air Show. TAI signed a cooperation agreement with the Russian company Irkut in the field of aviation during the Dubai Air Show, where the T129 "Atak" helicopter made its first demonstration flight. Within the scope of the agreement, the two companies will carry out joint design and production activities in the field of civil aviation.

Havelsan Staff Obtained MBA Graduate Diplomas

The first graduates of the MBA Program, organized since 2015 between Havelsan and Bahçeşehir University, obtained their diplomas

Bahçeşehir University Rector Prof. Şenay Yalçın, Havelsan General Manager Mr. Ahmet Hamdi Atalay, as well as Bahcesehir University academicians attended the ceremony held at Havelsan Headquarters.

Expressing her appreciation for the successful cooperation realized by the two institutions, Bahçeşehir University President Rector Prof. Şenay Yalçın noted in her speech that, "Such a cooperation made by Bahçeşehir University and Havelsan is a source of pride for our university."

Havelsan General Manager Mr. Ahmet Hamdi Atalay emphasized that Havelsan is a company competing with global giants and said that the personnel who participated in the program achieved this success after 2 years with intensive work. "Havelsan has world-brand competitors. In addition to quality, corporate processes, technology and sustainability, we need to compete with these world giants with our human resources. As a company carrying out activities in the software industry, we do not provide a competitive advantage regarding production line or mechanization. Our only resource to generate this competition is our human resources," said Mr. Atalay.

Mr. Ahmet Hamdi Atalay – General Manager of Havelsan


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A total of 84 Havelsan staff have completed the Master of Business Administration program within the framework of the cooperation that has been on-going since 2015. Within the scope of the program, the employees of the company have the opportunity to receive training from the leading academicians of Turkey after office hours at company headquarters. The employees attending MBA courses, without having to leave company premises, successfully completed their post-graduate degrees without disrupting their work.

Mr. Çağrı Bozbey, Havelsan Project Manager who graduated with honor said, "As an engineer, the MBA Program that I completed is not just a title on my CV, but an opportunity to better understand the environment and the world. I would like to thank Havelsan and Bahçeşehir University for this golden opportunity."

It is expected that the cooperation between the two institutions will continue in the forthcoming years with an increase in the number of participants. Havelsan provides its employees with the opportunity to receive postgraduate education at company headquarters shows its assertiveness to invest not only to technology but also in human resources.

Prof. Şenay Yalçın- Bahçeşehir University Rector

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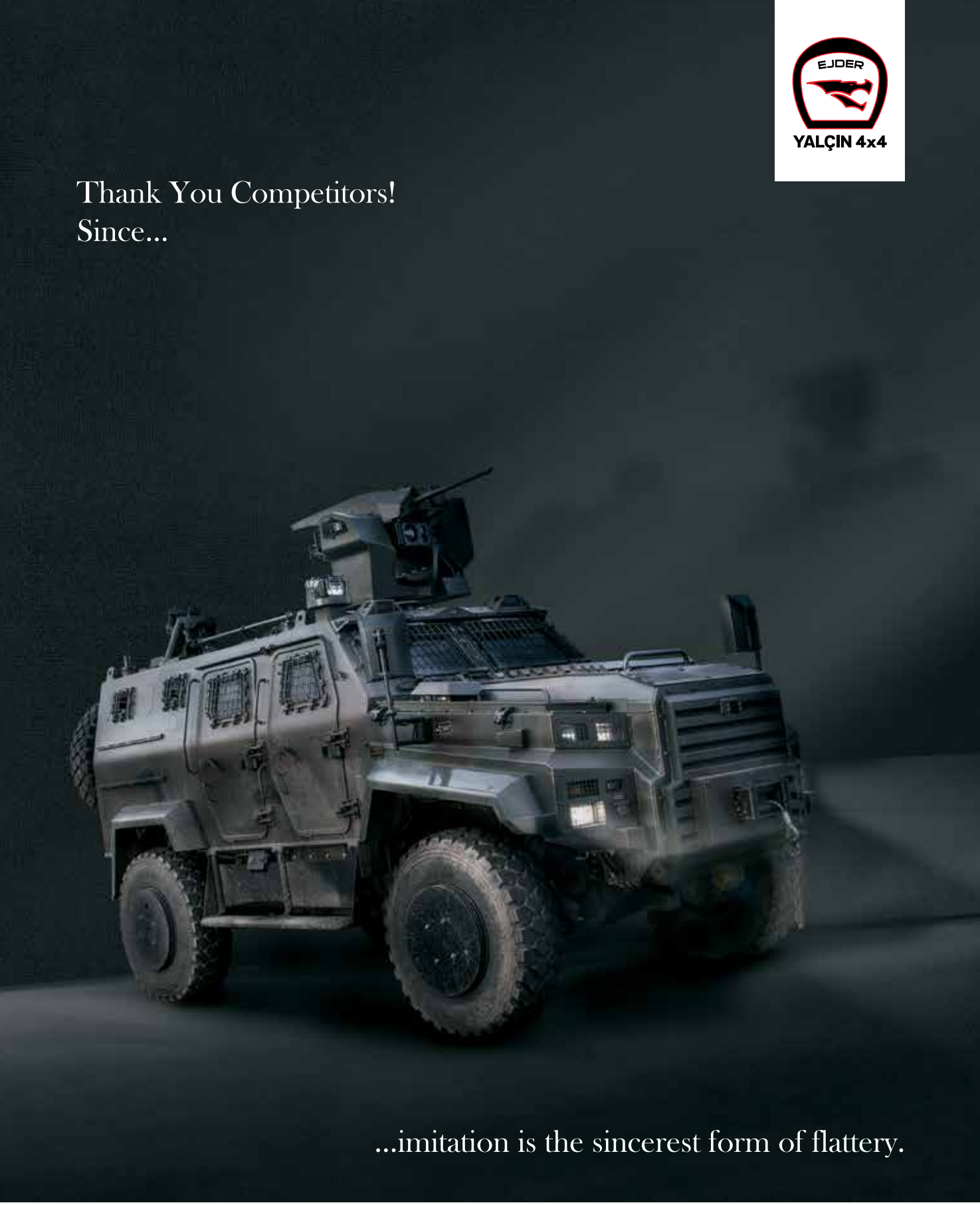
Thank You Competitors!
Since...



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