

DEFENCE TURKEY



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AN INTERVIEW WITH MR. AZİZ SİPAHI GENERAL MANAGER OF VESTEL DEFENCE INDUSTRY AND AYESAS

SIKORSKY: LOCAL CONTENT WILL BE CLOSER TO %80 END OF THE TUHP PROGRAM

THE FIRST C-130E MODERNIZED WITHIN ERCİYES PROGRAM WAS DELIVERED TO TURKISH AIR FORCE

"THINKING GLOBAL AND ACTING LOCAL," THE TURKISH AEROSPACE AND DEFENCE MARKET IS POSITIONED FOR TAKE OFF WITH HONEYWELL

NEW HORIZONS IN SEABORNE PLATFORMS' CBR DEFENCE

RAF PILOTS "EYE VIEW" FROM THE HAWK JET TRAINER AIRCRAFT

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**DEFENCE
TURKEY**



A New Milestone, A Significant Presence in Farnborough Air Show

Ayşe Akalın
Publisher & Editor in Chief

Most of the Turkish readers might remember how “Hürkuş” conquered all of our hearts at its roll-out ceremony. We all became only unite and one at that time and we enjoyed this unity. I think after this significant development once again all Turkish defence industry excited to participate to Farnborough Airshow first time, under a chalet of TAI among all aerospace global giants. It was so great to be witness of Turkish “Atak” helicopters on Farnborough skies with successful shows.

Prof. İsmail Demir, head of the Turkish Undersecretariat for Defence Industries (SSM) and Mr. Latif Aral Aliş, The Chairman of Defence and Aerospace Industry Exporters Association of Turkey, attended the Farnborough International Air show accompanied by a delegation from Turkey. This was their first official visit to Farnborough for Prof. Demir. During their two-day visit, the Undersecretary and his contingent met with international aviation and defence companies concerning such topics as the Turkish F-X program, jet engine procurement, the Turkish long-range air and missile defence program and the utility helicopter program.

We would like to congratulate all the staff of TAI, Turkish Armed Forces, Undersecretariat for Defence Industries and other Companies behind this success.

In this issue we are pleased to share with you, an interview with Mr. Aziz Sipahi, General Manager of Vestel Defence Industry and AYESAŞ; Mr. Jason W. Lambert Program Director Turkish Utility Helicopter Program; Mr. Orhan Geniş, Turkey and Central Asia, President of Honeywell and Mr. Serdar Çetingül, Regional Manager Turkey of Honeywell Defence and Space; Mr. Roy Minson, Senior Vice President, AV Inc; , Royal Air Forces Hawk Pilots; Mr. H. Vedat Uslu, General Manager of ICterra, recent developments and news; technical articles related with the products and capabilities geared towards the defence industry.

Enjoy this special issue...■



Vestel Defence Industry and AYESAŞ Complement Each Other to Strengthened its Presence on Global Markets

Mr. Aziz Sipahi, General Manager of Vestel Defence Industry and AYESAŞ informed Defence Turkey Magazine on two sister companies' activities, core capabilities, export activities, on going programmes, R&D studies and future strategies.

Defence Turkey: Mr. Aziz Sipahi, we thank you for taking the time to talk to us. Vestel Defence Industry produces land, marine and aerial platforms, while its sister company AYESAŞ provides software, and electronic and electromechanical systems to its customers . We would like to hear from you brief background information for the two companies and their scope of operations.

AYESAŞ [also known as “Aydın Yazılım”] was founded in 1990 as the Turkish subsidiary of a firm started in the U.S. by a Turkish entrepreneur. AYESAŞ was founded specifically to address the need for mobile radar stations, which, at the time, comprised a top-priority Defence program for Turkey; later, L3 Communications purchased the company and became its owner. In 2005, 60% of the shares of AYESAŞ were taken over by the Zorlu Group [parent company of Vestel Defence Industry] and currently, L3 Communications owns the remaining 40% of the shares. Back in 2003, upon first deciding to enter into the Defence business, the Zorlu Group had also established Vestel Defence Industry. As such, the group currently operates the two companies in the Defence business: AYESAŞ, a joint-venture, and Vestel Defence Industry, a wholly owned Turkish corporation.

We classify AYESAŞ as a systems company; Vestel Defence Industry, on the other hand, is a platforms company, as you also mentioned, and this is specifically due to its design and development focus on UAVs [Unmanned Aerial Vehicles]. AYESAŞ is involved in software development, electronic design, production, systems engineering and systems integration. It does not design or produce end-to-end platforms for land, naval or aerial uses. Its customers include some of the largest Defence and aerospace companies in the world, and those are primarily platform manufacturers.

Defence Turkey: Please describe for us your relationship with L3 Communications. Are there advantages to this partnership when operating in global markets, and conversely, are there any disadvantages when it comes to doing business in Turkey? We'd like to hear your assessment.

L3 Communications is a prominent U.S. company in the Defence and aerospace businesses, and one would expect to be deriving significant benefits from such a partnership; but in our situation, this is not exactly



the case, as L3 Communications is a silent partner in AYESAŞ, not directly associated with our operations. However, I should state here that it is our desire to be in a more collaborative relationship with them.

Defence Turkey: Vestel Defence Industry builds UAV platforms, while AYESAŞ produces sub-systems for avionics and command and control. What advantages do you derive from having these two companies, producing both platforms and critical technologies, as being positioned in the same group under your parent company?

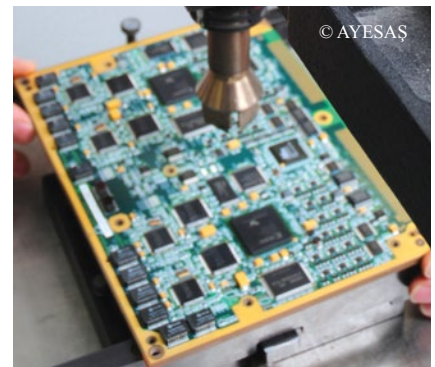
We experience some very significant advantages. As a systems company, AYESAŞ has either ongoing business or existing relationships with most large Defence and aerospace companies in Europe and the U.S. Therefore, it enjoys substantial name-recognition, which is very favorable for us. On the other hand, as a platform-supplier, Vestel Defence Industry presents an important advantage in those countries to which platform sales can be executed. I am leaving out the U.S. and Western Europe here, as we are aware of the difficulty in executing platform sales in those markets. The two companies complement each other, in terms of both technical infrastructure and targeted areas of operation, as well as their activities in the global marketplace.

Defence Turkey: You mentioned that with respect to the global marketplace, AYESAŞ is effective in the Western Hemisphere. Please provide information on the international companies you are doing business with and the projects you are involved in.

Of the top 20 Defence companies in the world, AYESAŞ does business with 10 of them, and has relationships with the remaining 10. These include Boeing, Lockheed Martin, Sikorsky, Rockwell Collins and GE Aviation in the U.S., and the Airbus Group, the Thales Group, the Kongsberg Group and Atlas

Elektronik in Europe. On a subsystems basis, we provide various solutions to all of the large platform builders in the business; these solutions range from electronics manufacturing services and software development to the production of various electromechanical systems. As such, AYESAŞ enjoys a high level of name recognition and accreditation among international Defence and aerospace circles.

Clearly, the most crucial international project we are involved in is the JSF [Joint Strike Fighter] program. Participation in this program is vital for both AYESAŞ and for Turkey in general. AYESAŞ is the only Turkish company that has a stake in the electronics design, production and software development aspects of the JSF program, and only non-U.S. company in the world to do so. This is an exception, as most of the JSF program components that are outsourced [from the U.S.] tend to be mechanical in nature; electronics design and software development activities are usually not outsourced from the U.S. We have already completed one software development project as a supplier to the JSF program; additionally, we are involved in two ongoing projects: we are the single-source supplier of the electronic circuit boards for the Panoramic Cockpit Display, and we are responsible for the design and manufacturing of the Missile Remote Interface Unit circuit boards. Due to



Circuit Card Assembly



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serious delays in the [overall] program, production has not yet ramped up to required levels; nevertheless, this is a program to which we attach much importance.

Defence Turkey: Which of your corporate capabilities and/or products stand out in those activities involving international companies with which you do business in Europe and the U.S.?

Although I would like to have cited our own products in response to your question, we currently do not have products that we sell as is to other companies. However, I can certainly elaborate in terms of the corporate capabilities we possess. AYESAŞ is primarily active on two fronts: command and control, and avionics. For command and control, avionics and aerial platforms, we are involved in software development, design, systems engineering and production activities. AYESAŞ may be viewed to be a somewhat conservative organization, but I feel that it is valuable to be known as a company that makes no compromises in integrity. Therefore, we have stayed away from leaping at every business opportunity that comes along; rather, we have preferred to focus on those activities corresponding to our core capabilities. In summary, I believe we are well established both in Turkey and overseas in the two areas I have mentioned.

Defence Turkey: Which companies does AYESAŞ do business with in Turkey and in which specific areas?

We started our avionics activities in Turkey in 2009; prior to that, we were involved in projects that were exclusively international in nature. Since 2009, we have been actively working with both TAI [Turkish Aerospace Industries] and Aselsan. Thanks to various projects dating

back, AYESAŞ is experienced in both embedded software development and in the design and manufacturing of electronics equipment such as command control consoles and electronics enclosures. While we work jointly with TAI, Aselsan and Havelan on aerial and naval platforms, I would have to say that our most intensive efforts are carried out in cooperation with Aselsan.

Defence Turkey: At the Eurosatory 2014 Land and Air-Land Defence and Security Exhibition held in France, Vestel Defence Industry promoted its ground control station on the premises of the French firm LH Aviation's exhibition stand, which was a first. Can you please comment on your cooperation with LH Aviation?

We did not initially announce that we would be exhibiting at the Eurosatory 2014 show, as we first wanted to observe certain preliminary results and wanted to wait and see how the whole thing developed. As you may know, for an extended period now we have been carrying out the design and production activities for our Karayel tactical unmanned aerial vehicle and its associated systems, including software development for the ground control station, the autopilot and core software control components.

LH Aviation is a mid-size but a well established French firm that does design and production of piloted aircraft. They approached us to explore opportunities for business cooperation. In the introductory meeting held in our offices, LH Aviation stated that while they had experience in piloted aircraft, they were inexperienced in UAVs in general, and specifically in converting an existing piloted aircraft into a drone by taking the pilot out of the equation, and that they were seeking to work with a firm experienced in UAV technology.

Following up, we had technical and administrative discussions held in Turkey and France, and have recently reached an agreement. The project involves taking LH Aviation's aircraft with a two pilot crew and transforming it, partially or in full, into an Optionally Piloted Vehicle [OPV].

Such optionally piloted aircrafts, which are able to fly with or without human crew on board the aircraft, have been gaining serious traction in both Europe and the U.S. One reason for their increase in popularity is the fact that in comparison to the U.S., Europe has much stricter rules governing the use of civil airspace by unmanned aerial vehicles. Thus, an OPV provides for piloted navigation of the UAV when such a vehicle needs to fly over populated areas, and unmanned operation otherwise. Our first presentation was to French prospects at the Eurosatory 2014 event in France, and we received an incredible level of interest. Our exhibits were inspected by over twenty high-level French and regional delegations. At present the business process is ongoing; we have completed preliminary agreements, and started on technical studies. Active implementation will most probably be started in the coming weeks. In this partnership, Vestel Defence Industry will be responsible for all electronics, software development, and autopilot development as well as for the ground control station.

We are aware that it would be difficult for us to sell our product, the Karayel UAV, completely on our own in France; for sales success, you need to partner with a local company, and this is especially true for Western Europe. No matter how technically superior a product you may have, executing sales is very difficult. Partnering with a local company forms an important aspect of our strategy. As a platform-builder, you may have some success establishing yourself in the East or even in certain countries; however, to do the same in Western Europe or the U.S., you need to do so on a "systems-basis" [by selling sub-systems and critical technologies], or by partnering with a company located there. Therefore, we decided that the local partnership approach was our only option to sell to French customers in France, a country that is at the forefront in Europe for unmanned aerial vehicles; and as such, our efforts are moving along successfully.

It needs to be emphasized that this partnership is also an indication of the progress made by Turkey, and



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Karayel UAV

by Vestel Defence Industry, in terms of UAV technologies.

Defence Turkey: When will you be commencing to the development phase?

As a first stage, we will develop a prototype of the system and will demo it to the user. The prototype will use the same electronics as our Karayel tactical UAV system, and a ground control station that is similar to the one used again by the Karayel system. Modifications corresponding to user requests and enhancements will be implemented in the second stage. Additionally, LH Aviation commands a large market for its products outside of France, and there is an especially high level of demand originating from North Africa. As such, this project is being closely watched.

Defence Turkey: Will this partnership also involve joint marketing of the resulting platform to third countries?

Yes, one of the goals of this partnership is sales of the platform to third countries. Frankly speaking though, as this is a project that has just been launched, we have not yet explored such marketing activities. But as I have mentioned earlier, LH Aviation has very active marketing relationships in North Africa and the Far East, as well as in certain Central Asian countries. There are no restrictions on the sales of this product; it is one that can be marketed anywhere. However, at the outset, we need to first have our French customer endorse the product, which we can then use as a reference in our marketing efforts elsewhere in other

countries.

Defence Turkey: As Vestel Defence Industry, your primary area of focus is UAV systems, where you have amassed considerable knowledge, technology and experience, especially in tactical UAVs. The Turkish Armed Forces is expected to start using the Karayel UAV in the near future. How is testing coming along for that product? Can you provide information on its delivery schedule?

While our primary focus is UAV systems, we also have two additional areas of corporate interest. One, while smaller in scope, is nevertheless highly important – we are conducting authentic technological research concerning fuel cells. I truly believe that what we are achieving in terms of research and development is at a scale that is unheard of in Turkey for a private sector firm, both in terms of the amount of investment we are making, and the quality of the research we are conducting. Our efforts related to fuel cells are continuing, and we are one of the companies cited worldwide in fuel cell research. We have several joint international projects that are ongoing.

Our other area of interest is naval systems, and we currently have offices located in Gebze [port town in Turkey located on the Sea of Marmara with a concentration of shipyards]. That location develops command and control hardware. However, as you have also mentioned, our primary area of interest is UAV development. In this regard, we do have international goals that transcend our objectives for the

Turkish market, but of course, things do take time. We are therefore employing various strategies, such as making our presence known at trade shows, and establishing partnerships through local companies to get our foot in the door in Western Europe.

There were serious delays in the delivery of the Karayel UAV, some due to us, but mostly due to factors beyond our control. Such delays need to be taken in stride when doing platform development and production projects, where brand-new requirements are being implemented. Especially the U.S.-based export license problems, related to the camera system, caused significant deferrals on our end. That problem has been resolved and I believe the cameras are expected to be delivered within a month's timeframe; we are continuing to do testing in the meantime. Presently, we are in a position to make delivery of the product. However, a critical feature request that was tagged on late is affecting delivery: testing for catapult launch and parachute recovery have not yet been conducted. Due to this, certain cascading delays may take place. Production of all UAVs slated for delivery is nearly complete, but the aforementioned issue may delay the delivery schedule somewhat.

I should also point out that this is the first project implemented in Turkey that adheres to the NATO STANAG 4671 standard, and Vestel Defence Industry is the first company in Turkey to do so. We understand that this standard will be a requirement in future Defence projects as well. The scale of additional overhead imposed by having to adhere to the 4671 standard and its overall effects may not be immediately apparent in any early assessment. As this standard casts an entirely new perspective on the design, production and testing processes, it has multiplicative results in both the project schedule and associated costs. Other than that, testing is proceeding well and, the delays notwithstanding, I am confident that we will be providing the Turkish Armed Forces with a quality product.

Defence Turkey: As you have mentioned, the Karayel project is a pioneering one, since it also happens to be one of the first projects where SSM's [Turkish Undersecretariat for Defence Industries] Airworthiness Certification has been implemented. For fixed-wing UAVs, what criteria must be met to qualify for the NATO STANAG 4671 standard? And as a follow-up question, what advantages



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does compliance with STANAG 4671 airworthiness standards provide for the Karayel UAV with respect to its export potential?

Responding to the first part of your question is somewhat difficult, as the standard in question is an exhaustive one. But I need to reiterate that adherence to the standard places a high level of burden on the implementing organization; each step that you may have already carried out will need to be redone per the NATO STANAG 4671 standard in question, as it is not possible to adapt to the standard any activity which you may have already completed.

I would like to emphasize one thing in particular; we knowingly took a hit on this one, and while that hit was larger than we had expected, we knew from the start that the decision to implement the standard would cost us time and money. Indeed, it truly raised our costs. However, we had anticipated that compliance would help us achieve a much higher quality product and would provide us with leverage in overseas markets, and in fact, those are exactly what have happened. Whenever we have met with representatives from an international company, we have observed an immediate change in their perception of us once we mentioned compliance of our product with the 4671 standard.

I would like to share with you a recent experience. I was meeting with representatives from a company that could be construed as the leader in Europe on UAV systems. When the topic was raised, they mentioned our efforts on the 4671 standard, and asked me whether they could observe in detail the processes we employed. They added that although they had been active in UAV systems for several years, they had started experiencing negative effects, relating to not having implemented their design and production processes in compliance with the STANAG 4671 standard.

I feel that the difference will become better understood as the Karayel enters the Turkish Armed Forces inventory and starts to be used, and also as it is readied for sale in overseas markets.

Defence Turkey: Besides the Karayel UAV, what research and development are you conducting on any other fixed-wing and rotary-wing UAV systems? Are you making related investments?

As Vestel Defence Industry we have the capability to be active in all categories of fixed-wing UAVs, and it is our intention to do so. Besides

the Karayel, we have two other, smaller UAV models. Additionally, we are conducting preliminary studies on a UAV that will be somewhat smaller in size than the Karayel, with differentiating features. We do not have any production activities for a large-scale UAV. For such a product, we would first need to see a request for tender be issued. So, to sum it up, I do not foresee any factors that could be limiting for Vestel Defence Industry in terms of fixed-wing UAVs. Indeed, of the outstanding UAV contracts in Turkey, we handle part of them solely on our own, and we partner with leading players in the industry for the remaining projects, which are few in number. We are also targeting to be active in a number of projects issued by the Turkish Ministry of National Defence and the Turkish Undersecretariat of Defence Industries.

However, all of what I have mentioned so far involve fixed-wing UAVs only, as the rotary-wing UAVs



are a different ballgame altogether. My comments earlier about AYESAŞ, and being viewed there as a somewhat conservative organization, apply to some extent for Vestel Defence Industry as well. We do not see ourselves as contenders in terms of a large-scale rotary-wing UAV, where we produce the entire range of components ourselves. And this is not due to any lack of initiative on our part. Rather, we know better than anyone else the challenges that would be involved for large-scale rotary-wing UAVs. We do have certain initiatives involving UAV electronics and aircraft-to-drone conversions, but we do not see ourselves capable in producing a rotary-wing UAV where we can tackle everything ourselves, as we do in the case of fixed-wing UAVs. And we think that those in Turkey who feel they can tackle it all by themselves do not have the domain knowledge. We are involved in the software and electronics aspects, but we do not have plans for a rotary-wing UAV platform.

Defence Turkey: In the past,

we did not see much of AYESAŞ or Vestel Defence Industry at the international Defence show circuit. But this seems to have changed lately, and you first exhibited at the Dubai Airshow 2013, then at the DSA 2014 show in Malaysia. Next you will be at the ADEX 2014 to be held in September in Azerbaijan. Would you like to comment on your increased exhibition activity, as well as your expectations regarding the ADEX 2014 show?

We did not exhibit our UAV efforts at international shows until 2013, not counting a couple of international shows back when we had first started our UAV efforts. But our goal back then was to gauge the reception we would get overseas in terms of the UAV marketplace. Then we realized that it was not prudent to exhibit without having a finished product; that's the reason why we have been holding back so long. We began exhibiting at trade shows once we were in a position to start to display our platforms and describe product features. There are certain regions in the world where you can enter the platform space. These include the Middle East, the Far East, the Turkic states region, and Africa. As you just mentioned, we started with the show in Dubai, and followed that with the exhibition in Malaysia. Our goal for exhibiting at the Dubai show was to get a feel for the Middle East market. We will be in Azerbaijan due to the historical affinity between that country and Turkey, as well as to promote ourselves. I am not optimistic on whether a business opportunity will materialize immediately following the ADEX 2014 show, but we know that there is demand for UAVs in Azerbaijan [and the region]. We know in fact that Azerbaijan is doing business with certain countries concerning UAVs. We are attending ADEX 2014 in part to see whether we can replace those countries they currently do business with, or possibly influence them to also start looking at Turkey as a solutions provider. In that region, this will be the first show we will be exhibiting in. After the relationships are built, we will look at the type of feedback we'll be receiving. To date, we have not actively dealt either with Azerbaijan or with any of the other Turkic states. Our only active contacts at this time are with prospects in the Middle East region. As our product line is rather new, I expect contacts to increase in the future.

Defence Turkey: What is your vision for Vestel Defence Industry and AYESAŞ concerning the next

decade?

We have a clear-cut vision for Vestel Defence Industry: our goal is regional leadership in UAVs. When I say UAVs, I am also including in that the aircraft-to-drone conversion activities. While regional leadership is our goal, our first priority is to carry out our commitments for deliveries of products to our customers in Turkey. Vestel Defence Industry's goals on the international front is to enter our targeted markets and possibly outsource the manufacturing of our products through partnerships in those markets. On a systems-basis, we need to provide products to markets in the West. We have a goal of setting up a regional center of excellence and expand overseas.

AYESAŞ does not have a short term goal related to platforms; on a systems-basis, our goal is to strengthen our position in the Defence and aerospace businesses. We are targeting to be a supplier of software and products to platform producers located in the U.S., Europe, and really any location in the world. We may need to supplement this vision with certain secondary areas of interest. Currently, AYESAŞ is in the process of an expansion where we are seeking to apply our capabilities in systems and software design and development to those business areas that are in the ecosystem of the Defence industry. We are again negotiating with international companies on this. Avionics software with its safety-critical traits may lend itself well for adaptation to certain secondary fields and we have tangible initiatives which we are following up on.

Defence Turkey: Mr. Sipahi, we thank you for allocating your time to talk to us. Is there anything you would like to pass onto the readers of Defence Turkey?

While the Turkish Defence and aerospace business has registered huge gains in the last decade, I feel we are still at the inception stage and that we have a long ways to go. Even the largest corporations in the Turkish Defence industry have very few products that can be classified as indigeneous; dependence on overseas technologies is still very strong. It is true that more than half of the demand from the Turkish Armed Forces is now being met from national sources. Nevertheless, considering the degree of local content and the availability of original indigenous products, I can't really say that we are in such a good place. We should not decry our gains, but we need to be realistic in our

plans for the future. Within the last decade, the Turkish Undersecretariat for Defence Industries contributed greatly to the successes achieved by the Turkish Defence industry; in a sense, it was a quantum leap for the industry. Certain Turkish companies are now being sought after in international projects, thanks to the quality of their products and their competitiveness. However, in the end, I can't say that the gains made are sufficient.

The Turkish Defence industry has a huge advantage in the Turkish Armed Forces being its reference user. This is an advantage that no other country in the region or possibly even in Europe can claim to hold. We need to make sure that we make the best use of this asset. When we are presenting at any country overseas and mention that our product is being used by the Turkish Armed Forces, we need say no more. Before anyone else, the Turkish Defence industry itself needs to grasp what a critical reference they have in the Turkish Armed Forces.

The support and contributions of the Turkish Undersecretariat for Defence Industries to the industry cannot be ignored, but I feel the processes employed need to be accerated. Sometimes I feel time is being wasted. The Undersecretariat needs to start treating the private sector firms with the same level of trust that it bestows on the firms owned by The Foundation for the Support of the Turkish Armed Forces [the parent investor of such companies as TAI and Aselsan]. I really feel it is time to review the implementation of the industrialization policies; the overall goals are on target, but care must be

taken not to get lost in the details. For years we have been hearing well-wishers promoting research and development, but the results achieved are not satisfactory. The fundamental reason for this failure is not knowing how to truly conduct research and development projects in Turkey. We seem to be focused too much on product development and get stuck in the stalemates created as a result of the product acceptance processes. I think our capabilities as Turkish Defence and aerospace industrialists are obvious and well-defined. Claiming that we are more capable than we really are may be all too well to impress the public opinion or to bolster morale, but privately we need to be realistic. We need to emphasize our strong points and identify areas where strategic investments are required.

As an example, AYESAŞ and Vestel Defence Industry are contenders in unmanned aerial vehicle technologies, avionics software, command and control systems, radar integration and circuit board manufacturing. But to lay claim for similar capabilities in other areas would not be realistic for us, at least for now. If a company produces circuit boards for the JSF aircraft, it should not claim to be producing the aircraft itself. We need to be well-grounded. We need to make the best use of our qualified human resources pool, which is one of our advantages, and we need to properly represent to the outside world such advantages that we possess.

Defence Turkey: Mr. Sipahi, we thank you for your time. ■



Mr. Aziz Sipahi, General Manager of Vestel Defence Industry and AYESAŞ met with Ayşe Akalın, Editor in Chief of Defence Turkey Magazine in Vestel Defence Industry and AYESAŞ Facility in Ankara



Agenda in Mind, Turkish Delegation Attends the Farnborough Air show

Prof. İsmail Demir, head of the Turkish Undersecretariat for Defence Industries (SSM) and Latif Aral Aliş, The Chairman of Defence and Aerospace Industry Exporters Association of Turkey, attended the Farnborough International Air show held in London between the dates of 14 and 20 July 2014, accompanied by a delegation from Turkey. This was their first official visit to Farnborough for both Prof.Demir and Mr.Aliş. During their two-day visit, the undersecretary and his contingent met with international aviation and defence firms concerning such topics as the Turkish F-X program, jet engine procurement, the Turkish long-range

air and missile defence program and the utility helicopter program.

As part of his Farnborough schedule, undersecretary prof.Demir visited BAE Systems' hospitality chalet and received information from the company representatives and test pilots on BAE Systems' simulation technologies, its Q-Sight helmet-mounted displays and the Hawk Advanced Jet Trainer aircraft, which the BAE Systems is proposing for use in the Turkish T-X program. Prof. Demir also boarded the company's Hawk trainer aircraft on display and experienced the inside of its cockpit firsthand.

The Turkish delegation later



Undersecretary for Defence Industries, Prof. İsmail Demir boarded HAWK Jet Trainer Aircraft in FIAS

visited the chalet of Thales UK. Undersecretary Prof.Demir examined the Diamond Airborne Sensing's Diamond DA42 MPP (Multi Purpose Platform) "Guardian" model, a light aircraft for reconnaissance incorporating ISR (Intelligence, Surveillance and Reconnaissance) solutions from Thales UK's Air Group. Prof.Demir was also briefed on the Avionics 2020 new generation future cockpit, unveiled recently by Thales UK, and a demonstration of the system was carried out. Undersecretary Prof.Demir also received information from Thales UK officials regarding the company's Lightweight Multirole Missile (LMM).



Mr. Hakan Buskhe, CEO of SAAB met with Undersecretary for Defence Industries, Prof. İsmail Demir in FIAS

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Prof. Ismail Demir examined Avionics 2020 new generation future cockpit in Thales Chalet

As part of his intensive two-day visit, Undersecretary Prof. Demir met with representatives of MBDA Missile Systems regarding T LORAMIDS (Turkish Long Range Air and Missile Defence System), a topic that has been in the headlines for some time. Prof. Demir also held meetings with both Pratt & Whitney and Sikorsky concerning the Turkish Utility Helicopter Program. Prof. Demir met with Bernhard Gerwert, CEO of Airbus Defence and Space, regarding possible future opportunities for business cooperation, and with Hakan Buskhe, president and CEO of SAAB AB, concerning cooperation opportunities, particularly with respect to the Turkish F-X program. The undersecretary also met with representatives from the Rolls-Royce and Honeywell firms. During his two-day attendance at the air show, Undersecretary Prof. Demir also made a visit to the TAI (Turkish Aerospace Industries) hospitality chalet, and along with TAI representatives, observed the T129 Atak helicopter's demo flight.

Undersecretary Prof. Demir: "Our First Priority for the F-X Program will be Platform Selection"

Defence Turkey Magazine met exclusively with Undersecretary Prof. Demir where he reviewed for us his visit to the Farnborough air show and the meetings he held there. Prof. Demir mentioned that at the air show, he and his staff have probed

cooperation opportunities with several international firms. He said: "As the office of the Undersecretariat for Defence Industries, we are currently pursuing more than 300 projects. Invariably, each project has one or more links to international companies. As I have stated before, Turkey is no longer a country to which you can execute a direct and simple sale. Turkey is now a country where things are designed and produced; I hope this is clear by now. Of course, it is important how clearly this is understood. What we need

to focus on here is the percentage of the opportunities for cooperative efforts that we are able to realize, and how much we, as a country, are contributing to the joint efforts and advancing our capabilities. If we can accomplish all of this, then Turkey will emerge as an alluring player in the world marketplace."

Undersecretary Prof. Demir also gave an important statement to Defence Turkey relating to the F-X program that is on SSM's agenda. He said that the possible options available regarding engine selection for the Turkish F-X program have been more or less identified, and that at the Air show, the companies who have been involved in negotiations so far had expressed interest in participating in the program. He added: "Of course, the program needs to be further developed and its details need to be ironed out. These things take time, and at the meetings we held at the air show, we did not get deep into the details, as we think this would have been somewhat premature at this time. Before anything else, we need to make a decision on the type of aircraft we are interested in. Then, based on our selection of the platform, there will really be only one or two choices left for the engine component. Therefore, based on our platform choice, the alternatives for the engine should also begin to take shape accordingly."



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Mükemmel Çözüm

AW101

AW101, KUZAY KUTBUNDAN, GÜNEY KUTBUNA KADAR 325.000'İN ÜZERİNDEKİ UCUŞ SAATI İLE SINIFININ LİDERİ ORTA/AĞIR KATEGORİ HELİKOPTERDİR.

03/04.02.2013 tarihlerinde

Portekiz Hava Kuvvetleri'ne ait bir AW101 Helikopteri , Atlantik ortasındaki 10.5 saat süren zorlu bir Arama ve Kurtarma görevini başarı ile yerine getirmiştir.

Operasyon süresinde, uçuş süresi 8.5 saat, görev mesafesi toplamda 912nm, tek yönde uçulan en uzun mesafe ise 680nm olarak gerçekleşmiştir.

AW101, kaza mahalline gece vakti ulaşmış arama görevini icra etmiş ve kazazedehin yerini sadece kendi sensörlerini kullanarak başarıyla tespit etmiştir.

Kurtarılan kazazede helikopterde gerçekleştirilen acil müdahalenin ardından kapsamlı tedavi için hastaneye nakledilmiştir.

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TAI Draws Accolades at Farnborough International Air show 2014

By Cem Akalın

The Farnborough International Air show ranks as one of the industry's biggest sales and technology showcases, and for the first time at this year's show, TAI (Turkish Aerospace Industries) displayed its Anka UAV (Unmanned Aerial Vehicle) and the T129 "Atak" Attack and Tactical Reconnaissance Helicopter. The displays were located in the static display area of the show. This was also the first time that TAI provided a corporate chalet for its visitors. The TAI premises featured three meeting rooms as well as hospitality and dining areas, in covered quarters measuring 160 m², plus a 75 m² spectators location reserved for viewing flight displays.

There was a large turnout at the TAI chalet during the event, which took place near London between the dates of 14 and 20 July, 2014. Representatives from TAI met with several interested parties, notably concerning the T129 "Atak" helicopter, as well as the "Anka" UAV, the "Hürkuş" basic trainer aircraft and the company's space and satellite systems. Additionally, TAI representatives held talks with company officials from Rolls-Royce, Northrop Grumman, GE Aviation, Sikorsky, Honeywell and Airbus Defence and Space, concerning forward-looking business opportunities and ongoing projects. Some of the international dignitaries who visited the TAI chalet include Air Vice Marshal of the Nigerian Air Force, Pakistani Minister of Defence Production, Kingdom of Bahrain Minister of Transportation, and Deputy Chief of the Defence Staff for United Kingdom.



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On day one and day two of the show, several Turkish dignitaries visited the TAI chalet, including Prof. İsmail Demir, Undersecretary for Defence Industries, who was accompanied by his team, Temel Kotil, general manager of Turkish Airlines, Hamdi Topçu, chairman of the board of Turkish Airlines, and Hayrettin Uzun, past chairman of the board of TSKGV (Turkish Armed Forces Foundation).

This was the first exhibition of the T129 Atak helicopter in Europe following its appearance at the Bahrain International Air show. It was a focus of interest for the attendees at Farnborough and the T129 held flight displays for three days from July 14 through July 16.

Preparations for T129 Atak flight displays began two months prior to the show

Following the flight displays, I met with the T129 test pilots Arif Ateş and Gökhan Korkmaztürk to discuss those flights as well as the prep work they

had to complete prior to the flights, and the process of gaining admittance into the air show schedule. Arif Ateş mentioned that there is more to the process of obtaining permission to perform at the air show than meets the eye, and that it is very intense process. He shared with me little known facts about the admission process: "We began training for the flight displays approximately eight weeks ahead of time. The Flying Control Committee for the Farnborough air show was informed of the names of those who would be conducting the flights and aircraft details, airworthiness certificates for the aircraft, and licenses and health checks for the pilots in question were all relayed to committee as well. The committee's approval is required for everything and therefore, the related correspondence with them was initiated eight weeks prior to the event. With the collaboration of the committee, we decided on our flying display sequences and we trained for those sequences through practice sessions at home. A week before the show, we presented a final rehearsal to the Flying Control Committee. Upon receiving our validation following completion of all necessary procedures, we successfully executed our flying displays on three days between 14 and 16 July."

Intense teamwork precedes flying displays

The other T-129 Atak helicopter test pilot Gökhan Korkmaztürk added that they had daily preparatory routines for the flight displays which they followed,



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and informed the Flying Control Committee of all of their sequences. He added: "Every move in the flight is executed per a plan agreed on by the team. We conduct a detailed preparation and perform rehearsals. We decide whether the flight display rises to the occasion in terms of the effect it achieves, whether it strains the helicopter and, in the end, if the effort is worth doing. Based on the results, we inform the authorities of our flight display profiles. At the Farnborough Air show, we advised the Flying Control Committee of all of our profiles ahead of time."

Korkmaztürk said that the T129 Atak helicopter, at its core, is an assault aircraft, and highlighting capabilities related to its assault role is not altogether possible at an air show. He said "Therefore, we instead demonstrate the maneuverability of the helo. We put the helicopter through almost all of the sequences that it would experience at the battle field, as well as during peace time operations. There are certain extreme aerobatics that would not be required on the battle field. At an air show, these are nevertheless displayed to demonstrate the agility of the aircraft."

T129 Atak – Uncanny combination of power and performance

Test pilot Arif Ateş expanded on the little known aspects of the maneuvers and choreographed aerobatics which the team executes. He emphasized that the performance of the aircraft is just as important as the engine power it possesses. He said: "To demonstrate the performance of the T129 Atak helicopter, we position ourselves at a high altitude and execute vertical ascends. For any type of helicopter, this is a show of that aircraft's performance and power. It is a demonstration of that craft's speed in executing a vertical ascend. The ensuing maneuvers display the helo's descend, roll and climb capabilities. The vertical climb is followed by a vertical descend, where we may reach a descend angle of 90°. This is followed by the so called high-speed maneuver, which displays the rate of speeds that the helicopter is capable of attaining. The next maneuver is the vertical climb where we may reach an angle of 80°. These are followed by hover turns, which demonstrate the performance of the tail rotor, and sideward flight, which demonstrates the helo's capability for



T129 Atak Test Pilots Arif Ateş and Gökhan Korkmaztürk

lateral movement. Finally, we have a maneuver that is specific to the T129 Atak; we take off backwards, then end our flight display with a descend."

During flight displays, helicopters are not allowed to descend below 100 feet above ground

Due to the risks associated with accidents at air shows, the Farnborough Flying Control Committee imposes certain limitations on the flights performed. There are strict limitations and rules for flight displays conducted at the air show. While aircraft strive to push the envelope to display their performance, behind the scenes, a rigorous effort is underway as well, to maintain safety. Briefings are held daily that bring together flight teams. Each day, the Flying Control Committee provides briefings to the teams that will be performing flight displays that day, to issues cautionary warnings. The instructions are clear: "Do not attempt any flight sequences other than those which you have rehearsed to the committee and for which you have been validated." Crowd and other aircraft separation distances must always be observed by flight displays. For helicopters, the minimum flight altitude is 100 feet above ground, below which they are not allowed to descend. The committee is actively present along the runways during flight displays, and have the authority to stop the displays whenever they deem that an unsafe situation and/or maneuver is present.

Engine power and high performance differentiate T129 Atak from its competition

Without a doubt, the toughest geographical conditions an assault helicopter may face are high altitudes and high temperatures. During the drafting of the specifications for the T129 Atak copter, the Turkish Land Forces called for the aircraft to be able to perform at 6,000 feet and at temperatures of 30° Celcius. Based on the feasibility studies conducted, the engine requirements for the T129 was modified and it was decided to fit the helicopter with the more powerful LHTEC (Light Helicopter Turbine Engine Company) CTS800-4A turboshaft twin engines, each capable of 1,360 horsepower. Currently, the T129 Atak is ranked as one of the most powerful helicopters in the world, based on the ratio of engine power to load lift capability. The T129 Atak's maximum take-off weight is 5,000 kg and has a range of 556 km, with a top speed of 288 km/h. Thanks to its powerful engines and high maneuverability, the T129 Atak's high performance puts it a step ahead of its rivals. A digital cockpit that reduces pilot workload and the platform's ability to allow the integration of advanced weapon systems such the 2.27 inch laser-guided "Cirit" missile and the long-range anti-tank missile "Mızrak-U", make T129 Atak one of the most advanced helicopters available today.

Turkish Defence Industry Products Protecting the World

Mr. Latif Aral Aliş; Chairman of the Turkish Defence and Aerospace Industry Exporters' Association (SSI), Turkish Defence Alliance (TDA)

Turkey, showing a rapid growth and development tendency with 2000s, is now the world's 17th biggest economy... Followed closely with its infrastructure investments and giant projects, Turkey has become popular in the world also with its defence industry products.

The defence industry in Turkey underwent a strategic transformation with a changing defence industry policy in 1990s and 2000s. In the past, Turkey met its needs through importation but now, it is generating solutions in critical areas of defence industry from design to production and from modernization to modification with nearly 1000 companies, factories, SMEs, research institutes and R&D laboratories.

The Turkish defence industry products are now taking place in the inventories of many countries, especially in the Turkish Armed Forces inventory which has high acceptance criteria. Turkish products having competitive features in terms of technology, price and quality such as aircraft and helicopter components, aircraft engines, armored land vehicles, vessels and motor boats, missiles, rockets, launching platforms, light arms and ammunition, electronic systems such as radios, command control systems, simulators, sensors and application software and logistic supports products such as field hospitals, military clothing and uniforms, engineering and technology transfer are now preferred worldwide...



Mr. Latif Aral Aliş; Chairman of the Turkish Defence and Aerospace Industry Exporters' Association (SSI), Turkish Defence Alliance (TDA)

The Turkish companies, playing critical roles in huge international projects and generate defence industry solutions with their indigenous products and systems are taking place in the world's biggest companies list.

Turkey, with the second biggest army of NATO, is one of the important defence centers of the world together with its defence industry. Turkey, which has initiated national combat aircraft project, produces training aircrafts, unmanned aerial vehicles, helicopters, missile and rocket systems, battleships, armored personnel carriers, infantry rifles, satellites and logistic support systems and designs simulations, software and

communication systems, is aiming to grow more and become one of the top 10 countries having the strongest defence and aerospace industry.

The Defence and Aerospace Industry Exporters' Association (SSI) founded in 2011, is gathering the defence and aerospace companies under a single roof in order to achieve such target. SSI has been performing studies in order to represent defence and aerospace sector in international markets and increase export performance and giving support to its members in terms of training and foreign relations.

SSI, which is the representative of exporters with almost 300 members, also attaches great importance to promotion and marketing activities. The Turkish Defence Alliance (TDA) established in 2013 has been performing promotion activities worldwide.

The Turkish defence and aerospace industry; with new ideas, indigenous products, qualified human resources and effective infrastructure, produces "national solutions to global needs", produces in Turkey and protects the world, and always ready for new collaborations, partnerships and duties...



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Defence Industry Asks for More “Domestic Product” Utilization from the Government

Mr. Latif Aral Aliş, The Chairman of Defence and Aerospace Industry Exporters' Association (SSI): “Our sector meets nearly 60% of defence needs of our country and this portion is continuously increasing.”

Mr. Aliş: “We, as defence industry, request from the government to increase domestic product utilization as well as support the sector in terms of international sales.”

Prof. İsmail Demir, Undersecretary for Defence Industries: “The export increase rate of the sector is doing well but insufficient for 2023 target. We will be taking radical measures in order to increase such rate.”

Mr. Latif Aral Aliş, The Chairman of Defence and Aerospace Industry Exporters' Association -one of the associations of Turkey that rapidly increases Turkey's export- exposed the latest status of sector, export potentials and targets in a meeting where Prof. İsmail Demir, Undersecretary for Defence Industries also attended.

In his speech, Mr. Aliş stated about the rapid sector growth and successful projects and added, “We increase our export activities every passing year. Our defence sector, has been growing by extensive R&D activities and technological investments, is now at the position to export one-third of the production. Our sector meets nearly 60% of defence needs of our country and this portion is continuously increasing.”

Mr. Aliş reminded that the defence expenditure amount in the world in 2013 was 1 trillion and 747 billion USD and stated that the targets will be reached through synchronized and efficient studies of Ministry of Economy, Ministry of Defence and Turkish Armed Forces.

Mr. Latif Aral Aliş pointed out that Turkish products have been increasingly favored worldwide especially in the past few years and added that Turkish companies Aselsan and TAI have been listed among the world's top defence companies. Mr. Aliş stated that they were expecting certain incentives from the government for the increase in exports and continued, “We expect financial support through private credit opportunities for our sector's developing export activities in addition to our desire of a progress in defence industry credits that are specific to countries and supported by the Treasury. Moreover, in interstate commerce, especially in sales between the countries of our region and also in new markets, increasing companies' exports in government's guarantee and support is a significant method. Within this context, we expect

the Government to adopt the relevant legislation to enable efficient sales. Government's increase in purchasing domestic defence products, these products entry into government's inventories and their utilization are among most considered issues in foreign markets. Therefore, we hope Turkish Armed Forces and security forces favor domestic products more”.

Turkey does not sell defence products to war territories

Mr. Aliş, underlined that Turkey did not sell defence products to war territories such as Syria and Iraq and added, “Our sector executes its export in line with the principles laid out by UN and NATO.”

Undersecretariat for Defence Industries to provide required coordination

The Undersecretary for Defence Industries Prof. İsmail Demir stressed the increase in exports in his speech at the meeting. “The increase in sector's exports is quite well yet insufficient for our 2023 target. We shall take the measures in order to raise the figures” said Demir and also underlined the need for an overall change in Turkey's industry. Demir stated that these measures are composed of “forming an inventory for industry and human resources, coordination among relevant units, establishing long-term plans, identifying resources and their efficient utilization”. Demir told that as Undersecretariat for Defence Industries (SSM) they will be providing the coordination between the sector and relevant governmental units and added, “There should be a coordinated industrial mobilization. Presently Turkey should not be regarded as a country to sell goods but should be

considered as a country to produce joint projects. My attendance to this meeting should be considered as a demonstrator of our government's support to this sector”.

Notes from SSI exports...

- Export of the Association reached from 600 million USD in 2008 to 1 billion 260 million USD in 2012 and 1,4 billion USD in 2013.

-Defence sector was the sector with the highest industrial export rate between January-July 2014 period. Where the export was 781 million USD in the first seven months of 2013, it rose to 952 million USD in the first seven months of 2014. Rate of increase compared with the figures of the last year is 22% and Turkey's overall exports increased by 5.7% within the same period. This figure indicates that defence sector is the leader in the increase of the export rates.

SSI introduced its end of year export figure as 2 billion USD. Turkey exported mostly to the United States of America (USA) within this seven-month period. Mostly, aircraft spares, light weapons and ammunition were exported to USA. Turkey became the source country to EU Countries, Commonwealth of Independent States, Caspian Region, Gulf Countries and Southeast and Far East Asia and Africa were determined as new markets.

Association exports aircraft and helicopter assemblies, aircraft engines, armored land vehicles, vessels and speed boats, missile rockets and shooting platforms, light weapons and ammunition, radios, command control systems, simulators, sensors and software, logistical support products such as kitchenware, hospital and clothing material, modernization and modification services and technology transfer. Association's export target for 2023 is determined as 25 billion USD.

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Sikorsky: Local Content will be Closer to %80 End of the TUHP

Mr. Jason W. Lambert Program Director of Turkish Utility Helicopter Program, Sikorsky Aircraft Corporation assessed Turkish Utility Helicopter Programme's current situation, local contribution in TUHP, delivery schedule and export activities in details for Defence Turkey Readers.

Defence Turkey: The Sikorsky S-70i programme, model helicopter, is to be produced in Turkey under a licence as a production model. Could you please inform us about the production model? How it will be processed and what are the details of the model?

It's licenced production that we have with TUHP prime contractor, TAI; we signed our agreement with TAI to produce a baseline quantity, of 109 T70 aircraft, which is the Turkish Utility Helicopter, for procurement by SSM that will be utilised by six end users. The 109 aircraft will be produced in two configurations; 89 aircraft in common utility configuration and 20 aircraft in a forestry firefighting configuration. Additionally, the licence enables TAI to manufacture optional aircraft which could take total count of T70s up to 300, representing the base line of 109 with options for 191. Under the licence, TAI is procuring a set of Sikorsky intellectual property, which includes engineering data, to enable the production of the T70 aircraft. The production will start with TAI performing final assembly and flight tests of the helicopter with Sikorsky starting out providing TAI a kit of all the parts required to produce the Black Hawks. Over time as TAI's capabilities increase, through support which Sikorsky will be providing, TAI will increase their manufacturing content and Sikorsky will decrease the content provided in the parts kit. For example, In the first five T-70 aircraft, Sikorsky will provide the cabin and the cockpit portion of the fuselage. However, by the sixth aircraft, TAI will manufacture their own cabin and cockpit. Over time, TAI's work share increases as they grow in capability and Sikorsky's work share decreases. That model follows through many components of the helicopter.

Defence Turkey: Could you please inform us about Aselsan's responsibility of TUHP?

Aselsan has a very large statement of work on TUHP as they are partnering with Sikorsky to develop a new digital cockpit for the Turkish Utility Helicopter. Planning and initial development is already under way. This new cockpit will create the avionics functionality for the Turkish Utility Helicopter for both T70 as well as for the international Black Hawk, the S-70i, that Sikorsky will be procuring back from Turkish industry for export sale internationally. This cockpit has several enhancements over the current glass cockpit that's utilized,



Mr. Jason W. Lambert Program Director of Turkish Utility Helicopter Program, Sikorsky Aircraft Corporation

including larger displays. It leverages functionality from the T129 Atak that was produced by Aselsan and TAI and then being structured in a manner to have a reduced pilot workload, which means that the functionality that we're designing into this product will make it easier to use and enable the pilots to provide more focus on their mission.

Defence Turkey: What is the maximum local contribution in this programme; I know that you will work with other Turkish companies as well and for the time being what is the rate of the local contribution?

Once we develop the initial cockpit, Aselsan will be providing the cockpit avionic systems for all the T-70s, additionally, in terms of local content, TAI will of course be doing the final assembly and flight tests from their facility in Ankara on all the T70s, they'll also be manufacturing the airframe or fuselage components for 104 of the 109 aircraft. They'll be providing the avionic and electrical components for 104 of 109 aircraft, once capabilities are developed, TAI will be manufacturing rotor blades for 60 of the 109 aircraft., In summary, there will be a very large quantity content at TAI and Aselsan. Additionally, from a local perspective, Sikorsky is making a significant investment in our joint venture, Alp Aviation in Eskişehir. Alp is a joint venture that Sikorsky has with the Alpata Group established back in 1998. The Alp organization will be manufacturing flight controls, precision machine components, gears, which are a new competency for Alp, additionally they'll also be

manufacturing transmission housings, which is also a new competency for Alp. The concept is a benefit for Turkish industry. While Sikorsky starts off with providing a kit with parts for TAI to assemble, over time Sikorsky's content is greatly reduced while Turkish industry's content is increased and as the industry's capabilities grow.

Defence Turkey: What is the total Turkish contribution rate in the programme? Can we say fifty-fifty or more?

I would say by end of the program, it will be drastically more, probably closer to 80% or more.

Defence Turkey: 80% at the end you say, what is the rate right now?

To start the programme, the content will be final assembly and flight test plus the , plus the empennage portion of the airframe that TAI manufactures today for Sikorsky with the addition of the Aselsan cockpit. Using rough percentages, I would say the content will start at 20% Turkish and finish at over 80% Turkish. And again it's a rough estimate, but the transition of content is very substantial under this program.

Defence Turkey: Within the coverage of the programme you gave a commitment in the contract proposal that every T70 helicopter to be produced in Turkey and one helicopter would be exported overseas. So how many helicopter purchases does this commitment cover and what is the size and the scope of this project at the end?

The level of industrialization was a critical factor in the establishment

Sikorsky
S70i

of TUHP. I view the industrialization in two pieces. The first is what we talked about for the T70 and its Sikorsky providing licenced data and the support to enable Turkish industry to produce an indigenous Black Hawk for their own use, for the six end users. The second portion of the industrialization comes from the buyback agreement we have with SSM. One of the components of that agreement includes Sikorsky procuring the final assembly and test service from TAI of an S-70i international Black Hawk for every T70 that is produced by TAI for SSM. What that means is the total production volume from TAI's production line will be minimum of 218 helicopters, that will be 109 T70s for use in Turkey and 109 S-70i for export, that could go up to a maximum of 600 total helicopters with the options, which could be 300 T70s for use in Turkey and 300 S-70i's for export. Regarding the export helicopters, the sale of the final product to the end user country will all be subject to US Government export approvals. The countries that we are delivering those aircraft to are countries that we are going to jointly market along with TAI. We see this from Sikorsky's perspective as having access to new markets internationally, where Sikorsky is the leader of Black Hawk production, to partner with TAI, a leading world-class aerospace company and also work with the government of Turkey and the government of the United States and their relationships with the worldwide community.

Defence Turkey: What can you say about the delivery programme schedule?

The delivery calendar starts in a couple pieces. The first point of note is the delivery schedule is subject to the final approval of US state department export licences, and we're currently in the process, working with our Turkish counterparts and the US State Department, on the submission of the licences for review by the US

government and the approval per the US Congress. Pending the schedule for the export licence approval, our delivery schedule is as follows: We will begin delivery of technical data under our licence agreement, to TAI at the end of 2015, we will provide kits of material, production parts that would go into the assembly of the helicopters, that would start in 2017 and run through 2024. TAI's final assembly is scheduled to begin at 2017 with the first aircraft being



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S70i Production line

certified and qualified for delivery to the Turkish Government in the early portion of 2020. The final delivery of baseline T70 is scheduled for 2025. One other major milestone we have as part of our program is regarding the Aselsan cockpit development, and currently, as I mentioned, we're in the development cycle with Aselsan to develop this new system with input from the Turkish government pilots and we're scheduled to deliver an international Black Hawk with an Aselsan cockpit, qualified by Sikorsky, in 2018. That will become the prototype aircraft for the Turkish Utility Helicopter Programme. So there's two phases of the start up work, one is the development of our new cockpit to be integrated into the Black Hawk and in parallel to that, we will provide parts to

TAI and work with TAI to help establish their final assembly line.

Defence Turkey: And I wonder, is there any possibility, in the coming years, that Sikorsky will move its S-70i production line from the United States to Turkey?

Actually, the S-70i production line today is not in the US. In the US we manufacture the Black Hawk derivatives for the US government and for foreign governments, under our foreign military sale programme. The current S-70i Black Hawk production line is in Mielec, Poland. Under TUHP, TAI will start the second S-70i assembly line for the aircraft that we will be purchasing back for export. Under TUHP, TAI will have two final assembly lines, one for T70s and second one for the S-70i.

Defence Turkey: What is the difference between the T70 and the S70i platform?

Once the cockpit is integrated in the aircraft, there will be little to no difference. The difference today is that the S-70i that Sikorsky manufactures currently contains the cockpit avionics system produced by Rockwell Collins. In the future, the S-70i and the T70 produced at TAI will contain the Aselsan avionics cockpit.

Defence Turkey: As a platform nothing changed except the avionics systems and the other electronic equipment.

Correct, the primary change is the avionics equipment, that will be the new system that we are developing with Aselsan and additional Aselsan systems such as the navigation, active vibration control and communication systems that Sikorsky will be integrating on the T70. The configurations of the S70i and the T70 will be near identical.

Defence Turkey: Thank you very much. ■



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Ms. Ayşe Akalın, Editor in Chief of Defence Turkey Magazine visited Sikorsky facility in Stratford, Connecticut, US

VERTICAL WIND TUNNEL
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Roketsan – Turkey’s Focal Point for Missile and Rocket Technologies

Roketsan was founded in 1988 per a decree of the Turkish government’s Defence Industries Executive Committee, with the purpose of establishing an organization to provide leadership in Turkey for rocket and missile design, development and production. The company’s initial venture was the production of propulsion systems for the Stinger missile, as a member

of the European Common Stinger Production consortium. During the early startup phases at Roketsan, several personnel were part of the engineering development activities focusing on rocket and missile technologies; those engineers steadily gained technological know-how in such projects as the Stinger program, as well as in other domestic and international projects, further developed their skills, and

applied them to new product designs.

Roketsan has been steadily gaining market share thanks to the products and services it renders to the Turkish Armed Forces and to entities across the globe; thanks to its range of products and its quality, Roketsan is fast becoming a trusted vendor in Europe, the Middle East, the Far East, Americas and Africa.

Roketsan Shaping the Future with New Product Releases

The 2.75 in (70 mm) Laser-Guided Cirit Missile

The 2.75 in (70 mm) Laser-Guided Cirit Missile has been designed by Roketsan as a high-precision and cost-effective solution, for use from attack helicopters against light armored vehicles as well as stationary and moving targets; it is qualified in its category as the first ever mass-produced guided missile. Aside from being a primary ammunition system aboard the T-129 Atak helicopter, the Cirit can also be used on the AT-802 border security aircraft and the AH-1W Cobra attack helicopter. The Cirit can also be integrated into diverse platforms such as unmanned aerial vehicles, land vehicles, stationary land platforms, light assault aircraft and naval platforms. It is also the first guided missile to enter service in the armed forces of a number of allied countries as part of mass-production

contracts. The first export of the Cirit was in 2013 to the armed forces of the United Arab Emirates.

Some of the distinguishing features of the Cirit are its ease of integration, an 8 km extended range, midcourse guidance using MEMS-INS, terminal guidance using semi-active laser seeker, insensitive munitions, multi-purpose warhead (armor piercing, anti-personnel and incendiary) and high-explosive warhead. The design of intelligent pod systems to meet customer requirements is possible.

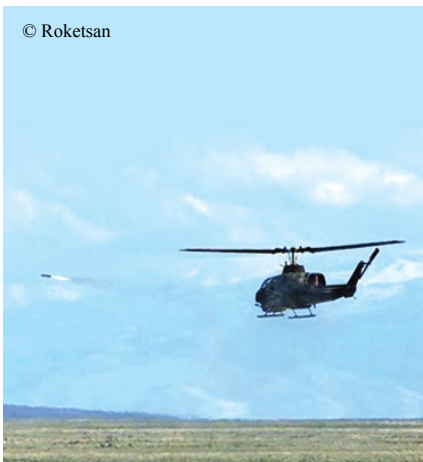
An MoU was entered into between Roketsan and MBDA Germany at the ILA Berlin Air Show 2014 to integrate the Cirit missile into the Eurocopter Tiger attack helicopter used by the German armed forces. Per the agreement signed, a preliminary study will be conducted for the integration effort, to be followed by a proposal for a solution that targets the specific

needs of the German Bundeswehr.

The Long-Range Anti-Tank Missile Mızrak-U

Primarily developed for use by attack helicopters against heavy armored main battle tanks at ranges up to 8 km, the Mızrak-U also finds viable use on aerial, land and naval platforms as a long-range anti-tank missile. The original program was launched to procure a long-range anti-tank missile for the Turkish Armed Forces; the program mission was described as the destruction of armored and mechanized enemy troops, as well as halting, delaying and channelling their advances. Capable of operating under all weather conditions day and night, the Mızrak-U boasts fire-and-forget guidance.

The missile also has a fire-and-update mode for flexibility in updating target designation, allowing for firing from behind terrain masks and firing against targets concealed behind



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Cirit Product Description	
Diameter	2.75 in (70 mm)
Maximum range	8 km
Weight	15 kg
Propellant type	HTPB-based, smokeless, composite solid propellant
Warhead types	Insensitive munitions, multi-purpose (armor piercing, anti-personnel and incendiary), and high-explosive
Guidance	Midcourse guidance using MEMS-INS, terminal guidance using semi-active laser seeker
Target types	Light armored vehicles, troops and bunkers
Platforms	Attack and light combat helicopters, UAVs, land vehicles, armored personnel carriers, light assault aircraft, naval platforms and stationary platforms

SOME THINGS **NEVER CHANGE**

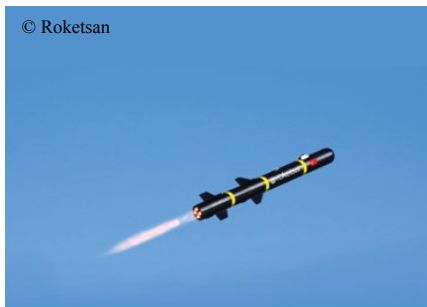


THE WORLD HAS CHANGED a bit since we started back in 1937. Over the years, we've helped nations increase their readiness in a world that constantly poses new challenges for corporations and civil security authorities alike. And we couldn't have done it without change.

So we've changed technology. And it's changed us. There's really just one thing that remains the same. After more than 70 years, we are still challenging the laws of nature and pushing the boundaries of the possible.

Some things never change. ●●●●





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terrain masks, accurate adjustment of the point of impact, and damage assessment capability. Mızrak-U may be used against both stationary and mobile targets.

Being one of the primary ammunition systems aboard the assault and tactical reconnaissance helicopter T-129 Atak, the Mızrak-U can also be integrated into other platforms including UAVs, land vehicles, stationary platforms, light assault aircraft, and naval platforms. The missile has the option for two types of seekers: laser and thermal imaging infrared. Equipped with advanced technologies, both configurations have powerful destructive effect on all types of armored threats. Both the laser seeker variant of the Mızrak-U and the laser-guided 2.75 in Cirit missile can be cued by the same designator and can be fired from the same launcher.

The Mızrak-U is effective against main battle tanks, with several features that make it superior than competing anti-tank systems. The system was developed for stressing environmental and climatic conditions, and tested against military standards for applicable environmental factors; in February 2014, a 100% precision strike accuracy was achieved on test firing from helicopter using infrared seeker. Missile qualification tests are on-going, and mass-production is being planned to start in 2015.

The Mid-Range Anti-Tank Missile Mızrak-O

Having features similar to the Mızrak-U, the Mızrak-O is a mid-range anti-tank missile system. The missile is highly effective against all types of armored threats in the battlefield, thanks to its advanced technologies. Developed primarily for the infantry in surface-to-surface use, the Mızrak-O has a maximum range of 4 km and a minimum range of 200 meters, with ability to operate under all weather conditions day and night.

Mızrak-U Product Description	
Maximum range	8 km
Weight	37.5 kg
Warhead type	Tandem charge, effective against reactive armor
Seeker	Imaging infrared (IIR) or laser
Target types	Armored fighting vehicles, tanks
Platforms	Helicopters, land vehicles, light assault aircraft, naval platforms

SOM (Stand-Off Missile) Cruise Missile

An air-to-surface munition system designed for use against actively protected land and naval targets, the next generation SOM cruise missile boasts a modular design to support operational flexibility. It has a 250 km extended range, low



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SOM Cruise Missile Product Description	
Maximum range	250 km
Weight	610 kg
Warhead	Dual-stage tandem charge, high explosive particle impact and light armor piercing
Guidance	Navigation using INS, GPS and terrain hugging, image based navigation, imaging infrared seeker, automatic target recognition
Target types	Air defence systems, parked aircraft, strategic assets, ships, command and control centers, bunkers

visibility, high maneuverability, and the ability to operate under all weather conditions. The missile has entered mass-production and is planned to be integrated to the F-4E Terminator 2020 and the F-16 Block 40 combat aircraft fleet of the Turkish Air Force. The SOM missile is also being targeted for use as a modern, sea-skimming cruise missile, through its integration into the new JSF (F-35) combat aircraft, as

part of the joint initiative between the Turkish Air Force and the JSF program. Additionally, feasibility studies have begun towards the integration of the SOM missile into the Eurofighter Typhoon and similar new generation platforms from Airbus Defence and Space, following an agreement entered into between Roketsan and Airbus Defence and Space at the ILA Berlin Air Show 2014.

Mızrak-O Product Description	
Diameter	160 mm
Maximum range	4 km
Minimum range	0.2 km
Weight	35 kg (including composite tube)
Propellant type	HTPB-based, reduced smoke, composite propellant
Warhead type	Insensitive munitions tandem charge, effective against reactive armor
Guidance	Imaging infrared (IIR)
Target types	Armored fighting vehicles
Assault types	Direct lay and overhead assault
Launcher imaging system	Thermal sight and video image

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Hisar-A Low Altitude Air Defence Missile

Low and Medium Altitude Air Defence Missile Systems Hisar-A and Hisar-O

Hisar-A and Hisar-O are new generation low and medium altitude air defence missile systems with advanced technological capabilities. In development by Roketsan, these systems are being designed to protect mobile and stationary land contingents against air-based threats. The missile systems are designed to provide protection against existing and emerging threats. Tactical features include fire-control system, command and control, vertical launch capability, two-stage rocket engine, infrared seeker, RF data link and multi-platform integration. The first test firing, realized in October 2013, was completed successfully. In the test, the missile separated successfully from the launcher and completed its flight at its calculated course.

The Roketsan Multi-Barrel Rocket Launcher (MBRL) Systems

The Roketsan surface-to-surface multi-barrel rocket and missile launchers are modern fire support systems with capability for high mobility; these launcher systems support 107 mm, 122 mm and 300 mm rockets and missiles, and allow critical targets in the 3 km to 100+ km ranges to be neutralized with accurate strikes. The basic make-up of the Roketsan multi-barrel weapons systems battery includes the launcher, command and control vehicle, ammunition supply vehicle, MET vehicle (housing meteorological radar

and maintenance and repair vehicle. The systems have been designed and configured to meet diverse user requirements. Versions using tactical wheeled vehicles and tracked vehicles are designated as models T 107/122, T 122/300 and T 122.

The T-122/300 multi-purpose multi-barrel rocket launcher can fire 40 rounds of 122 mm or 4 rounds of 300 mm rockets and missiles, with the ability to perform mass lethal fire. The T-122/300 serves as a deterrent force thanks to its long range and mass fire capabilities. In addition to its standard tactical role in providing support for ground maneuver forces, it responds to a wide range of responsibilities including assault with fire support, as well as peace-time operations.

Being a modern fire support system, the T-107/122 multi-purpose multi-barrel rocket launcher system allows for an operational range from close battle area to behind the enemy lines at 40 km, allowing for the neutralization of critical targets with precision firing; it uses 107 mm and 122 mm rockets and features high mobility. T-107/122 system has been designed with shoot-and-scoot tactical maneuvers in mind. For both ammunition types, sealed and thermally insulated and tropicalized pods are used. This provides protection against adverse environmental conditions during storage and field use; additionally, launcher reloading is handled with ease and reloading time is minimized. Thanks to their modular and flexible configuration, the Roketsan MBRL systems also possess the capability to use rockets and guided munitions to be developed in the future. Support is provided for munitions of multiple calibers and different types of warheads.

Antisubmarine Defence Warfare Rocket and Launcher System

The Antisubmarine Defence Warfare rocket has been developed for use against subsurface targets from surface platforms, at a range of 500 to 2,000 meters and a depth of 15 to 300 meters; it functions through integration with the weapons management system and the sonar associated with the surface platform, and features automatic direction capability. The system can be fired at targets in single or burst fire modes, and detonation at a desired depth can be achieved with remotely activated fuze.

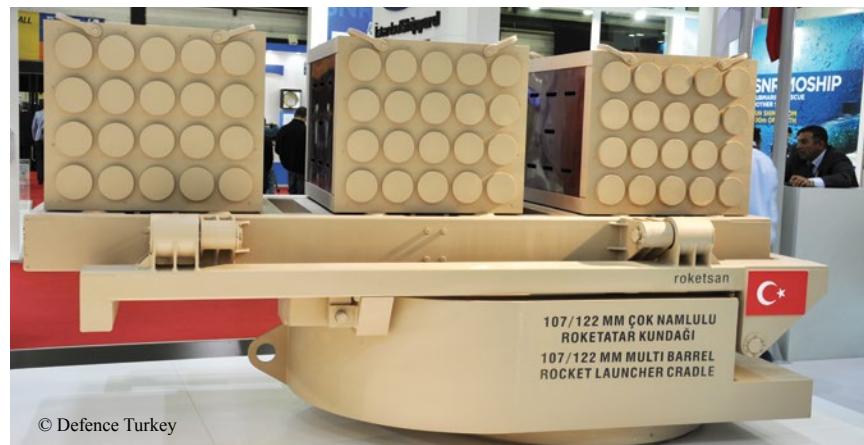
The ASW rocket possesses a high-explosive warhead with insensitive munitions, a desirable feature in modern munitions. The launcher system has such features as stabilization and automatic and manual direction. The fire control system calculates the required firing parameters using navigation and target data acquired from the surface platform.

Ballistic Protection Center

Roketsan has recently placed into operation its Ballistic Protection Center to meet the ballistic protection needs of both military and civilian platforms. The Center is tasked with the design and development of the indigenous armor system to be used in the Turkish main battle tank Altay.

Conclusion

Roketsan, with its expert personnel and strong corporate foundation, has the capabilities required for the design, production and materials and system testing of light and heavy armored vehicles, aerial and naval platforms and perimeter protection solutions, compliant with national and international standards.



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“Thinking Global and Acting Local”, The Turkish Aerospace and Defence Market is Positioned for Take off with Honeywell

Mr. Orhan Geniř, Turkey and Central Asia, President of Honeywell and Mr. Serdar etingöl, Regional Manager Turkey of Honeywell Defence and Space assessed Honeywell’s activities and strategies towards Turkey, ongoing programmes and industrial cooperation with Turkish Companies.

Defence Turkey: First of all Thank you very much for the interview. Could you please inform us about Honeywell Turkey's office, its structure and activities?

Mr. Orhan Geniş : Honeywell is a diversified technology and manufacturing company serving customers worldwide with aerospace products and services; control, sensing, and security technologies for buildings, homes and industry; turbochargers; automotive products; specialty chemicals; electronic and advanced materials; process technology for refining and petrochemicals; and energy-efficient products and solutions for home, business, and transportation sectors.

Honeywell's Aerospace products and services are used globally on virtually every commercial and business aircraft operating today, as well as for defence and space applications to make flying safer, more reliable, more efficient, and more cost effective. Honeywell Aerospace also provides comprehensive global aftermarket services and support, including logistics, engineering services, and customer-tailored solutions that include a broad range of repair and overhaul programs, digitization, and innovative service solutions.

Turkey, and indeed the Central Asian region, have been identified as "high growth" regions for us, where we see opportunity to support the growth of industry with large parts of our portfolio. High-growth countries such as China, India, Russia, Middle East, Brazil, Mexico, Indonesia, Vietnam, Turkey and the central Asian region are experiencing rapid urbanization, a significant rise of a middle class population, growing demand for energy and resources, and huge investments in infrastructure construction -- all of which present huge opportunities for Honeywell's three strategic business groups – Aerospace, Automation and Control Systems and Performance Materials and Technologies.

"Thinking global and acting local" is the foundation block of our High-Growth Region management strategy. This ensures we can deliver capabilities from across our portfolio seamlessly, addressing each market's unique requirements. We also have a strong corporate social responsibility culture, and our regional organizations play an active role in contributing to the training and education of local people to ensure the future economic growth of these countries.

Defence Turkey: What are Honeywell's core capabilities,

technologies, products focused on aerospace and defence?

Mr. Orhan Geniş : Honeywell Defence & Space (D&S) is a world leader in the supply of diverse products for defence and space applications. Honeywell D&S designs and manufactures propulsion engines, auxiliary power units, environmental control systems, life support systems, avionics, controls, wheels and brakes, actuators, valves, electrical power generation and distribution systems, and lighting for defence companies and governments worldwide. This includes fixed wing aircraft, helicopters, surface systems (land and water) and space. In addition to our products, Honeywell provides a worldwide service and support network.

Defence Turkey: Could you please enlighten us about past Honeywell activities performed over the years in Turkey?

Mr. Orhan Geniş : Since 1992 Honeywell has been serving in our country with its own office and staff comprised completely of Turkish engineers and employees. The giant industrial facilities such as Tüpraş, and Petkim use Honeywell automation systems for better quality and more efficient production and less energy is consumed, and a more comfortable and safer environment is created for the employees in many smart buildings such as the Towers of İş Bankası, and the Ford Otosan Factory, thanks to the automation systems installed by Honeywell Turkey.

In line with the gradually increasing importance of Turkey in the international arena, the office of Honeywell Turkey has progressed rapidly from being a local office to the territorial headquarters for the "Turkey & Central Asia" region. With a demonstration and training center in operation at the Honeywell Turkey office since 2012, Honeywell Turkey has been able to provide training services to many countries.

We continue to deliver technologies that improve efficiency and reliability on defence platforms operating in Turkey today. These include the F-16, C-130, UH-1 and UH-60. Our T55 engines also power the CH-47 Chinook Heavy Lift Helicopter, a new fleet of which is on order for the Turkish Army. In addition we are working to identify opportunities on forthcoming indigenous platforms, including the Turkish Light Utility Helicopter, Trainer/Fighter and UAV as well as our continued support for the propulsion engines on the T129 Atak helicopter program.

Defence Turkey: It is known that Honeywell is one of the candidates



Mr. Serdar Çetingül, Regional Manager Turkey of Honeywell Defence and Space

within the Indigenous Helicopter Program. Could you please inform us about your activities in this program? What is your technological competence on the engine systems that you offered for this project?

Mr. Serdar Çetingül : Originally developed for the stringent requirements of the US Army Comanche helicopter program, the CTS800 turboshaft engine is a product of the Light Helicopter Turbine Engine Company (LHTEC), a highly successful 50/50 partnership dating back to 1984 between Honeywell International and Rolls-Royce plc. The CTS800 engine offers unparalleled levels of power-to-weight ratio and fuel-burn economy in a compact package with unmatched performance for high & hot operational environment, supportability and maintainability characteristics. These inherent features combine to provide exceptional improvements in cost of ownership, on-wing performance, operational capability, and logistical support flexibility, all of which have been verified as a result of extensive testing, demonstrations, and validations conducted by the U.S. Army throughout the Comanche helicopter program.

The U.S. Army needed a high performance helicopter but also one that could offer significant fuel efficiency gains over the existing fleet -- as a result the CTS800 efficient engine was designed to offer the lowest SFC for a turboshaft engine in its size class, consuming only 0.46 lbs. of fuel/ lbs. of power. The CTS800 features a two-stage centrifugal flow compressor and annular reverse flow combustor, as well as a



two-stage axial flow turbine operating at an output speed of 23,000rpm and a Digital FADEC with built in test capability.

Both Honeywell and Rolls-Royce understand the need for the Turkish Light Utility Helicopter to meet the global market demands of a modern five ton helicopter platform, with significant input in its development coming from Turkish industry. To achieve this objective LHTEC is pursuing a civil export version of the CTS800 engine that will incorporate substantial Turkish collaboration design projects and industrialization via parts manufacturing, production assembly test, and depot repair establishment.

Defence Turkey: What are your activities in the Hürkuş Programme? Could you please inform us about the sub systems that you can provide for this program?

Mr. Serdar Çetingül : Honeywell's Aerospace is committed to working with TAI to provide high performance navigation solutions for the Hürkuş-B Trainer Aircraft. Although I cannot go into specifics today, these products are proven commercial off-the-shelf (COTS) fully qualified equipment that meets TAI's mission requirements.

Defence Turkey: LHTEC CTS 800-4A engines were integrated to the Atak Helicopters delivered to Turkish Land Forces. What will be your logistics support within this program?

Mr. Serdar Çetingül : Each Atak helicopter is powered by two LHTEC CTS800-4A turboshaft engines which have a reputation for compactness, light weight, reliability, power and durability.

Ease of operation through improved maintainability has been another important design driver for the CTS800 engine family. The CTS800-4A engine incorporates features to operate with a maintenance philosophy of "on-condition" (i.e. without a fixed Time Between Overhaul), which reduces depot maintenance costs and workload. Time interval inspections are dependent upon operating hours and cycles. However, all direct maintenance actions are managed "on-condition" based on inspection limits as prescribed in the

maintenance manuals. The CTS800-4A engine is based on a modular design. All engine Line Replaceable Units (LRUs) can be removed on-wing with the engine installed, allowing easy access the LRUs. The CTS800-4A engine and LRUs do not require rigging or complex adjustments upon engine installation, which means operators benefit from a leaner two-level maintenance policy; Organizational (O) and Depot (D), eliminating the Intermediate (I) level of maintenance completely.

Engines which cannot be rectified in accordance with the Line Maintenance Manual shall be removed from the fleet at Organizational Level and sent to the Depot Level facility for repair. LHTEC is currently evaluating the transfer of Depot Level Maintenance (DLM) capability to either TLF or TEI, as directed by SSM, subject to establishment of the necessary DLM License agreement with the selected facility.

Defence Turkey: Both the Regional Jet project and the FX/TX program are important programs in Turkey's agenda. What are your activities in respect to these two programs?

Mr. Serdar Çetingül : It is too early to go into specifics. However, Honeywell's Aerospace products and services are used globally on virtually every commercial and business aircraft operating today, as well as for a wide range of defence and space applications. We have many years of experience in collaborating with local partners on a wide range of subsystems such as electric power, environmental control, Auxiliary Power Units (APUs), propulsion, flight safety systems, communication and navigation and surveillance systems. We are always looking for opportunities to use this expertise to support new programs in Turkey and around the world where we believe our technologies can make a difference by improving the efficiency, performance, safety and mission success of platforms and operations.

Defence Turkey: Could you please inform us about the other projects that you are carrying out and your

cooperation with TAI and other Turkish companies? Is there anything else you wish to mention?

Mr. Orhan Geniş : Our core focus is to partner with Turkey to help achieve its objective of building a more indigenous and self-sufficient defence industry, for both the home market as well as for export. Honeywell regards Turkey as one of its key strategic countries. It is our intention to continue expanding our in-country partnerships within Aerospace, contributing to Turkey's goals in this sector.

We remain committed to working with Turkish industry, including our partners TAI with whom we work closely on the T129 Atak, to define and produce the most technically capable, safest, cost effective, lowest risk, and lowest lifecycle cost solutions available. We have been very successful already in establishing a local presence in fast growth countries all over the world, so by combining this with a heritage of developing aerospace technologies that dates back over a century, we are in a fortunate position of being able to offer a complete solution to most defence requirements.

To help it achieve its objectives of building an indigenous defence industry, Turkey is looking for partners that can transfer the right knowledge and skill sets to help empower the local workforce. Additionally it has a growing desire to optimize its fleets performance by reducing grounding time, increasing operational efficiency and extending the overall lifecycle of its aircraft. This is why we see strong demand for retrofit and upgrade technologies and Performance-Based Logistics (PBL) services in the market today. And finally it is of course looking for the best engineering in the industry, to ensure its fleets compete effectively in the modern battlefield. There are very few companies beyond Honeywell that have the breadth of portfolio to be able to deliver against all of these requirements simultaneously and this is why Turkey's defence sector is such an exciting place for us to be at this time. ■

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The First C-130E Modernized within Erciyes Program was Delivered to Turkish Air Force

Following the completion of acceptance tests, the first C-130E and 1 ground mission planning station, the modernization of which were realized by TAI – main contractor - within the scope of C-130E/B Avionic Modernization – Erciyes Program, were delivered to Turkish Air Force Command. Turkish Air Force Commander General Akın Öztürk, Undersecretary for Defence Industries Prof. İsmail Demir and many military and defence officials attended the ceremony held at TAI premises.

Pointing out the significance of Erciyes Program at his speech made at the delivery ceremony held at TAI premises, Air Forces Commander General Akın Öztürk said, “Our old and faithful C-130 aircrafts, which are the backbone of our transportation strength, were modernized with national capabilities and rejoined our Air Forces in order to serve our nation.” General Öztürk also stated that the aircrafts planned to take place in the inventory until 2040 are aimed to become more efficient, economic and safe with the modernization of 19 C-130 aircrafts.

Undersecretary for Defence Industries Prof. İsmail Demir stated that the aircrafts will be equipped with state-of-the-art technologies and hold multipurpose mission computers having high mobility. Prof. Demir mentioned that all modernization activities will be completed in 2016 and 19 aircrafts are planned to take place in the inventory.

TAI Chairman of the Board Mr. Yalçın Kaya stated that all modernization activities within the scope of Erciyes Program are being performed by Turkish engineers and technicians in Turkey in such a way that ensure flight conditions appropriate to international aerospace rules as well as military and civil aviation

standards. “The local companies such as Aselsan, STM, Selex, MEGE Teknik, BITES, MilSOFT are aware of their responsibilities and have been trying to perform their tasks in harmony and coordination with TAI and as of the point arrived, they have proven that they deserve the confidence counted on them”, continued Mr. Kaya. “I also want to emphasize the significance of uninterrupted flight support as well as knowhow and experience share by Air Forces Command in the successful accomplishment of the Project” added Mr. Kaya.

Once completed, C-130E and C130B aircrafts taking place in the inventory of Air Force Command will comply with GATM, RVSM and CAT-II ILS requirements. The new avionic system will be fully NVIS capable, have a glass cockpit with four MFDs, two CDUs and two Multi Mission Computers. Link-16 Tactical Data Link Integration, which allows interoperability capability with other platforms in the inventory, will also be made on the aircrafts to be modernized within the project scope.

The very first “Supplemental Type Design Approval Certificate” from the first Local Certification Authority

Within the scope of the Project, also the flightworthy of the aircrafts under the modernization scope has been certified by issuing Supplemental Type Design Approval Certificate by the first Certification Authority composed of representatives from Undersecretariat for Defence Industries and Armed Forces. In addition to design and



Previous Cockpit before the modernization phase

development activities, conducting certification activities in aviation field under the supervision of a national authority for the first time is one of the milestone that our country has achieved by this project.

The Avionic Modernization of the first mass production aircraft, which was initiated in March 2014, will be realized at TAI premises and 2nd Air Supply and Maintenance Centre of Air Force Command at Kayseri. The modernization activities of 13 C-130E and 6 C-130B aircrafts will be realized within the scope of the program, the contract price of which is 181 million USD. Within the scope of the program, Aselsan, STM, AYESAŞ, Selex, MEGE Teknik, BITES and MilSOFT have responsibilities as subcontractors.



Modernized Cockpit in C-130 Program

Raytheon to Provide Torpedo Integration on Alenia Aermacchi Aircraft for Turkish Navy

Raytheon Company will serve as weapons integrator for Italian aircraft manufacturer Alenia Aermacchi, providing 31 months of engineering services support for integration of MK 54 and MK 46 torpedoes onto the Alenia Aermacchi ATR-72-600ASW maritime patrol aircraft.

Raytheon received a \$5.7 million contract to support Alenia Aermacchi's test, integration and qualification for the external carriage and tactical employment of the lightweight torpedoes. Alenia Aermacchi is the prime contractor on the Meltem III contract under which it is obligated to provide ATR-72-600ASW aircraft to the



MK 46-Lightweight Torpedo

Turkish Navy.

"This international partnership takes advantage of Raytheon's deep knowledge of aircraft weapons

integration, including the Raytheon-designed MK 54 and MK 46 torpedoes," said Dr. Thomas R. Bussing, vice president of Advanced Missile Systems at Raytheon Missile Systems. "Raytheon engineers are known worldwide for their expertise and will strive to be valuable team members on this co-development effort."

The MK 54 and MK 46 can be deployed from a surface ship, helicopter or fixed wing aircraft to track, classify and attack underwater targets. The ATR-72-600ASW is designed for patrolling, rescue, sea and coastline protection from security and environmental threats.

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Tümosan Wins Indigenous Power Pack Development Contract for “Altay” Turkish Main Battle Tank

In a decision adopted by the Turkish Defence Industry Executive Committee on 6 August 2014, the Turkish diesel engine and tractor manufacturer Tümosan has been tapped as the vendor to carry out the Indigenous Power Pack Development Project for the “Altay” Main Battle Tank, for which the Undersecretariat for Defence Industries completed its efforts on proposal evaluations. The committee decided to commence contract negotiations with Tümosan for the power pack that will be used by the “Altay” Main Battle Tank. The competition for the tender, pending for the past three years, pitted Tümosan against two other firms, HEMA and BMC.

Concerning the project which Tümosan has been pursuing since 2011, the company, in a statement addressed to the Public Disclosure Platform (an entity that facilitates the release of legally required notifications governing the Turkish capital markets and stock exchanges), stated that it had committed to implementing the project for the most reasonable price, with the highest amount of local content and at the shortest duration. The statement went on to say that “Tümosan will carry out the phases for the design, development, prototype production, integration into the “Altay” Main Battle Tank and system certifications, of the indigenous power pack. The power pack for the Altay battle tank consists of diesel engine and hydro-mechanical transmission. As a company that produces its own tractor design at European Union standards, using diesel engines again produced by Tümosan, we share with our investors the honour of being tasked with the



Altay Main Battle Tank

development of the power pack for the first indigenously produced Turkish battle tank.”

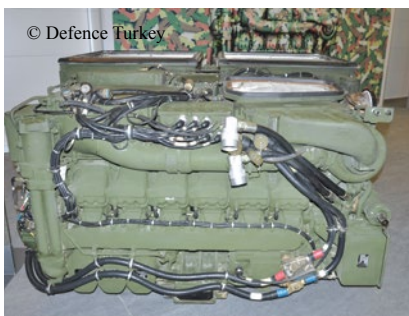
Power Pack Prototype Development for the Altay Main Battle Tank to be Completed in 6 Years

Top priority for the project is the use, to the greatest extent possible, of existing domestic facilities and capabilities for the original design, development, prototype production, test and certification of the power pack to be utilized as part of the Altay Main Battle Tank. The project calls for the acquisition of technical support from abroad where required. Tümosan general manager Mr. Kurtuluş Öğün said that establishing the infrastructure necessary for the development of the diesel engine and the hydro-mechanical transmission would play a lead role in Turkey’s industrialization efforts and its quest for competency, and added “since 2004, we have been investing in research and development efforts in the area of diesel engine and transmission technologies, and we are pleased that we’ll be using the knowledge we have accumulated towards the realization of the Altay Main Battle Tank Power pack Project.” Mr. Öğün said that the development program would help to minimize Turkey’s foreign dependence

with respect to the modernization and production of wheeled and tracked vehicles for the Turkish Armed Forces, and would also eliminate third-country export restrictions. Mr. Öğün added that the development program would also contribute to the efforts towards indigenous production in the civilian sector, especially for diesel engine and transmission development in the Turkish automotive industry.

The development process targets Tümosan gaining design capability for diesel engines in the 300 to 1,600 horsepower range and associated hydro-mechanical transmissions. The Altay Main battle tank power pack is comprised of the engine component (V-type, turbo diesel, water-cooled, rated for operations in the ambient temperature range of -45 °C to +49 °C), the transmission (electronic-control system, hydrodynamic/hydrokinetic, 1,500 horsepower), cooling system, air intake system and exhaust system.

The program will entail two phases – the prototype development phase and mass-production. Defence industry sources anticipate a five to six-year period for the completion of the first phase. Following successful completion of the contract, the second phase (i.e. the mass production of the power pack) would then be negotiated by the Defence Industry Executive Committee at that time.





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Peli-Hardigg Mobile Military Standard cases

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Peli-Hardigg Mobile Office: With these cases soldiers can, in minutes, set up a field office of durable field desks, administration desks, and bookshelves. And for personal gear storage, nothing beats a secure footlocker and trunklocker.

Peli-Hardigg Mobile Medical: These cases include customisable inserts and options to organise and protect lifesaving medical gear.

Peli-Hardigg Mobile Master and ISP2 Cases: Provide transports for 463L pallets, NATO and Euro pallets. Mobile Master 463L are pallet-ready cases whose non-slip ribs stack all four sizes firmly together to get the maximum usable space per pallet while no moisture or contaminants get through to the supplies. The



ISP2 Cases virtually eliminate load movement with a unique Inter-Stacking Pattern (ISP): a 10x10 cm squared pattern bottom that matches with the cube pattern on the case below.

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and other industries.

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By developing custom solutions, testing new materials and continuously improving designs based on user feedback, they have been able to build a robust line of cases that proudly live up to the harsh demands of the military, aerospace



Medium Altitude Indigenous Air Defence Missile Accomplished First Test-Fire with Great Success

Hisar-O Project - Medium Altitude Indigenous Air Defence Missile Project- was commenced in order to meet Turkish Armed Forces' Low and Medium Altitude Air Defence requirements and is expected to compete with its contemporaries in the world. The first test-fire of the Ballistic Test Missile was successfully completed on July 23, 2014 in Aksaray, a city in Central Anatolia, with the participation of officials from Turkish Land, Air and Naval Forces Commands, Undersecretariat for Defence Industries,

Aselsan and Roketsan.

During the tests, performed within the scope of the Project, the missile separated successfully from the launcher and completed its flight at its calculated course. The accomplishment of such tests is a completion of another milestone on Turkey's roadmap for developing the first indigenous air defence missile.

Within the scope of this project launched by Undersecretariat for Defence Industries in 2011, radar, command control and fire control



systems are developed by Aselsan, while Roketsan develops missile systems.

Turkey Requests AIM-120C-7 AMRAAM Missiles from the Government of United States

The State Department has made a determination approving a possible Foreign Military Sale to Turkey for AIM-120C-7 AMRAAM missiles and associated equipment, parts, training and logistical support for an estimated cost of \$320 million. The Defence Security Cooperation Agency delivered the required certification notifying Congress of this possible sale on August 11, 2014.

The Government of Turkey has requested a possible sale of 145 AIM-120C-7 Advanced Medium Range Air-to-Air Missiles (AMRAAM), 10 missile guidance sections, and 40 LAU-

129 launchers, containers, support equipment, spare and repair parts, integration activities, publications and technical documentation, test equipment, personnel training and training equipment, U.S. Government and contractor logistics, engineering and technical support, and other related elements or logistics and program support. The estimated cost is \$320 million.

Turkey is a partner of the United States in ensuring peace and stability in the region. It is vital to the U.S. national interest to assist our NATO ally in developing and maintaining a strong and ready self-defence. This proposed sale is consistent with those objectives.

The Turkish Air Force (TurAF) intends to obtain these missiles to modernize its inventory, which will support its own air defence needs and improve its interoperability with the U.S. and other NATO allies. These missiles will be used on the TAF's F-16 aircraft (and eventually their F-35 aircraft) and will maintain the TAF's air-to-air capability to defend its extensive coastline and borders against future threats. Turkey will have no difficulty absorbing these additional missiles into its armed forces.



The proposed sale of this equipment and support will not alter the basic military balance in the region.

The principal contractor will be Raytheon Corporation in Tucson, Arizona. There are no known offset agreements proposed in connection with this potential sale.

Implementation of this proposed sale will require multiple trips to Turkey involving U.S. Government and contractor representatives for technical reviews/support, program management, and training. U.S. contractor representatives will be required in Turkey for integration, testing, and training. The number and duration are unknown and will be determined during contract negotiations.



The US Air Force (USAF) has successfully fired two AIM 120 missiles from the F-35B Lightning II joint strike fighter (JSF) in July



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Defence Turkey Visited Maricenprog, Italian Programming Center in Taranto

MBDA hosted media representatives from all around the world including Defence Turkey Magazine at Maricenprog, Italian Programming Center in Taranto. In the press briefings Maricentadd Commander, Marcello Bernard, Maricenprog Director Gianpaolo Blasi and the engineers gave presentations on activities and capabilities of Maricenprog within FREMM (European multipurpose frigate), Orizzonte- Horizon class frigate (Air-defence destroyers), Cavour (Italian aircraft carrier), Commandante Class Patrol Ships, DDG-Maestrale refitted Programmes. During the tour, ITS Cavour Shore Integration and Acceptance Center, test centers of patrol boats, Orizzonte, Garibaldi, Fremm, DDG refurbished center, Link Area, Remote support center, and Room C-DEP (Ballistic Missiles multinational programmes) were visited.

Maricenprog, Italian Navy Programming Center

Maricenprog located in Taranto is responsible for developing and managing the operating software used by Command and Control Systems on board all Italian vessels, as well as developing and integrating tactical data link systems, developing of new generation C2 Systems, life cycle support and configuration management of C2 systems in service, conducting system test and technical/operational training. The center has successful cooperation with Italian Defence Industry with a total staff 80 military and civilians.

The origins of Maricenprog date back to June 1968 with foundation of Maricensadoc (Italian Navy SADC Center) which was then transferred to Taranto in 1970 and renamed Maricenprog.

In addition to the its main mission to implement the Operating Software for Command and Control Systems

installed on naval vessels (aircraft carrier Cavour, Orizzonte, Fremm, Garibaldi etc), Maricenprog also distributes to their entire development cycle. Definition of requirements and operating specifications for onboard systems, the preparation of preliminary system architecture studies, monitoring and control of operating software, ensuring interoperability with platforms that operate tactical data links and the engineers assigned to system operation, maintenance and software production are realised in this center.

Maricenprog also acts as a center of excellence for the Italian Navy in tactical data links and has the systems and equipments needed to perform development, integration, testing and interoperability verification activities.

In the center, between 1972-2014, total 49 ships (33 ships of them still in service) were equipped and 5 ships will be equipped in the coming period.

ITS CAVOUR Shore Integration & Acceptance Center

Cavour is an Italian aircraft carrier and the newest flagship of the Italian Navy She is the largest unit in the Marina Militare (Italian Navy) and was launched in 2004. The ship is designed to combine fixed wing V/STOL and helicopter air operations, command and control operations and the transport of military or civil personnel and heavy vehicles.

This center mission is to provide a shore facility for CMS SW maintenance, developing &



operator's training in a ITS Cavour Combat System fully compliant replica. The laboratory are composed by subsystems of the Naval Combat System (Subsystems emulators & simulators, real subsystems and devices).

Along with Italian vessels, Multi Data link Process Subsystems (developed by Selex) are tested in this center for Finish Navy.

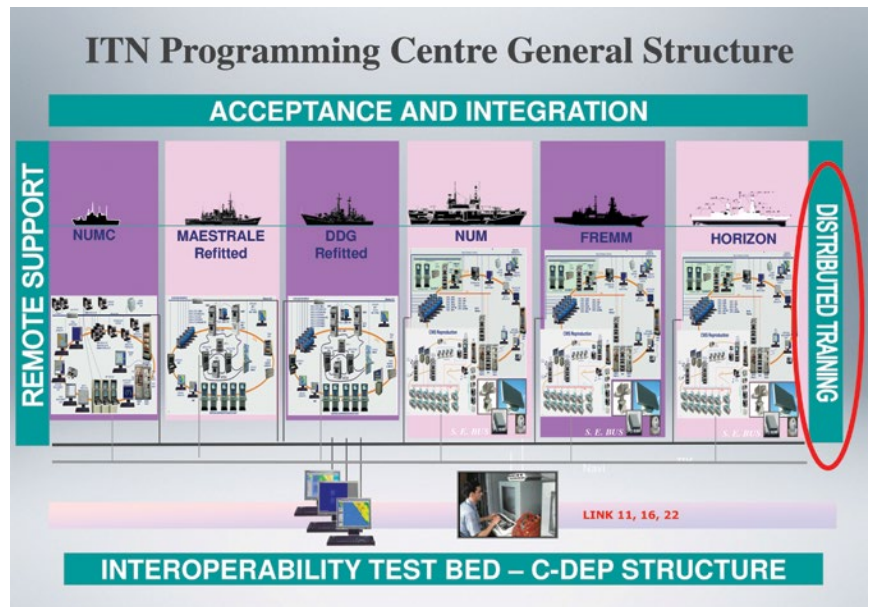
Horizon Class Shore Integration & Acceptance Center

The Horizon-class are a class of highly sophisticated air-defence destroyers in service with the French Navy and Italian Navy. The programme started off as the Common New Generation Frigate (CNGF), a multi-national collaboration to produce a new generation of air-defence destroyers. In Italy the class is known as the Orizzonte-class, which translates to Horizon in French and English.

France, Italy and the UK issued a joint requirement in 1992 after the failure of the NATO Frigate Replacement for the 90s (NFR-90) project. The resulting CNGF programme consisted of the Horizon frigate and its Principal Anti Air Missile System (PAAMS). The Principal Anti Air Missile System (PAAMS) is a joint programme developed by France, Italy and the United Kingdom for an integrated anti-aircraft warfare system. PAAMS is designed to track, target and destroy a variety of high performance air threats, including saturation attacks of very low altitude (sea skimming), supersonic cruise missiles, fighter aircraft and UAVs. PAAMS, with its Sylver Vertical Launching System, can launch 8 missiles in under 10 seconds while simultaneously guiding up-to 16 missiles to designated targets at any one time

Afterward Uk withdrawal, France and Italy continued their collaboration under the Horizon project, ordering two ships each which deploy the PAAMS missile system. The Italian Navy ordered two units, Andrea Doria (D553) and Caio Duilio (D554), to replace the Audace-class destroyers. Andrea Doria was accepted on 22 December 2007 .

Within this programme, this center provides CMS SW maintenance, developing & operator's training of Horizon Class Combat System, Anti-



ship missiles TESEO and DAVIDE integration to the vessels The Teseo is an Italian-built, anti-ship and coastal attack missile first built by the Italian company Oto Melara jointly with Matra and now made by MBDA.

C - Dep: Coalition Distributed Engineering Plant

In 2007, with support from the company SELEX-SI, the C-DEP (Distributed Engineering Plant Coalition) structure has been created. This capability provide the possibility to federate ASTT

(MARICENTADD), MARICENPROG SIACs and ITN Assets (Ships, aircrafts, helicopters, submarines) with similar geographically distributed NATO/Coalition Centers.

This plant of Maricenprog is a technological platform to test interoperability of systems and operational procedures, involving geographically distributed Centers and wide area networks by using dedicated protocols. This structure, created by the federation of various MARICENPROG SIACs, it's managed by a Control Room, composed by hardware and software components such as Scenario generator and Animator (DIS o HLA), Recording e analysis Tools, Network monitoring, VoIP and VTC capability, Simulation of tactical communication using DIS protocol. The C-DEP structure has the capabilities focused on Operative Scenario sharing, Voice Over IP, Link 11 and Link 16 data exchange over IP protocols, Force Engagement Order Exchange and Remote support

session's activations.

Moreover, in the center Italian Navy Distributed Training structure allows single operator and functional teams training using a combination of live, virtual and constructive simulation. To realize distributed Training methodology is necessary for a network infrastructure to inject a scenario from a master scenario generator to remote sites, allowing training activities even to harbour moored units.

Many activities and exercises have been conducted since 2007 in C-DEP facility. IT Navy conducted more than 20 NATO/Coalition Training or Technical events as follows:

- > Coalition Warrior Interoperability Exercise (CWIX)
- > Active Layer Theatre Ballistic Missile Defence Ensemble Test (ALTBMD ET)
- > Maritime Theatre Missile Defence (MTMD)
- > NATO Ballistic Missile Defence (NATO BMD)
- > Medium Extended Air Defence System (MEADS) Interoperability Demonstration (in progress)

The activities such as European Air and Missile Exercise Alliance (EAMDEX), Maritime Theatre Missile Defence (MTMD), Fleet Synthetic Training (FST) with US Navy and RAMSTEIN ALLIANCE (NATO BMD) will be planned by the end of 2014.

The role of Maricenprog in NATO Ballistic Missile Defence Programme

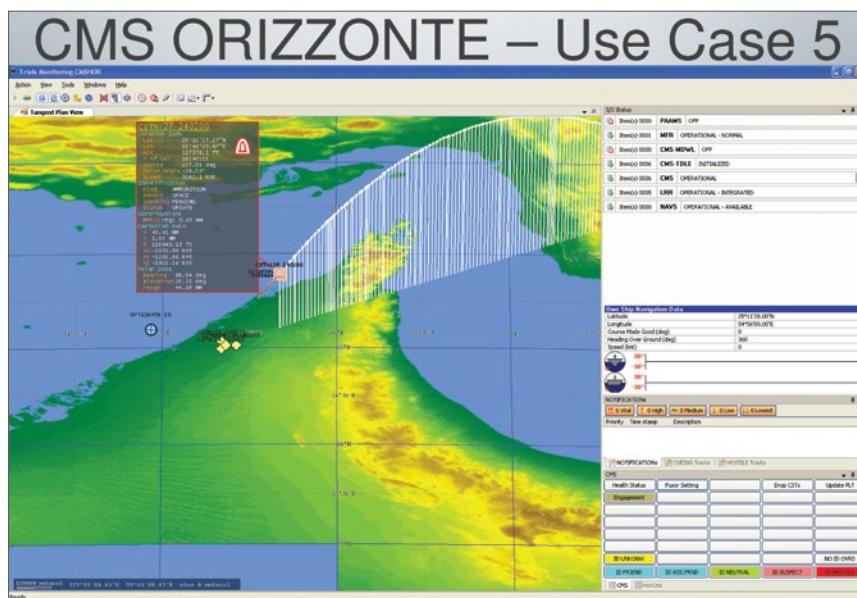
NATO Ballistic Missile Defence (BMD) was established in September 2005 as the Active Layered Theatre

Ballistic Missile Defence (ALTBMD) Programme, for the protection of deployed forces. This followed the completion of a two-year feasibility study in which eight NATO nations and various NATO projects cooperatively participated. As a result of the NATO Lisbon and Chicago Summits in November 2010 and May 2012 respectively, the programme was expanded to include the protection of NATO European populations and territory. An interim theatre ballistic missile defence capability was fielded in 2010 followed by an interim territorial defence capability in May 2012.

The focus of the Programme is the upgrade, test and integration of NATO's command and control (C2) systems and underlying communication network to enable effective information exchanges between various NATO and national missile defence systems. This integrated system-of-systems architecture will create a larger range of detection, communication and missile defence capabilities for NATO forces, whether deployed within or beyond NATO's area of responsibility, and NATO populations and territories.

Italian Navy's DORIA Class with a CMS including a Tactical Data Link fully Ballistic Missile defence

Capable. NATO program is structured in Ensemble Tests (ET) sessions performed in net-centric environment. Each ET aims to verify a different capability. The goal of the



ET 1, played in autumn 2011, was to establish the NATO BMD architecture, using software models, developed by the Nations.

MARICENPROG developed Italian software model called CMS Orizzante -Use Case 5.

For the Ensemble tests 2, Maricenprog realized the first BMD prototypical software version of Doria Class CMS, running in a hardware controlled environment, connected to the others NATO BMD assets. In winter 2014 NATO will run the Ensemble tests 3 dedicated to Non Real Time activities. MARICENPROG developed and employed a Mission Planner, based on NATO NIRIS

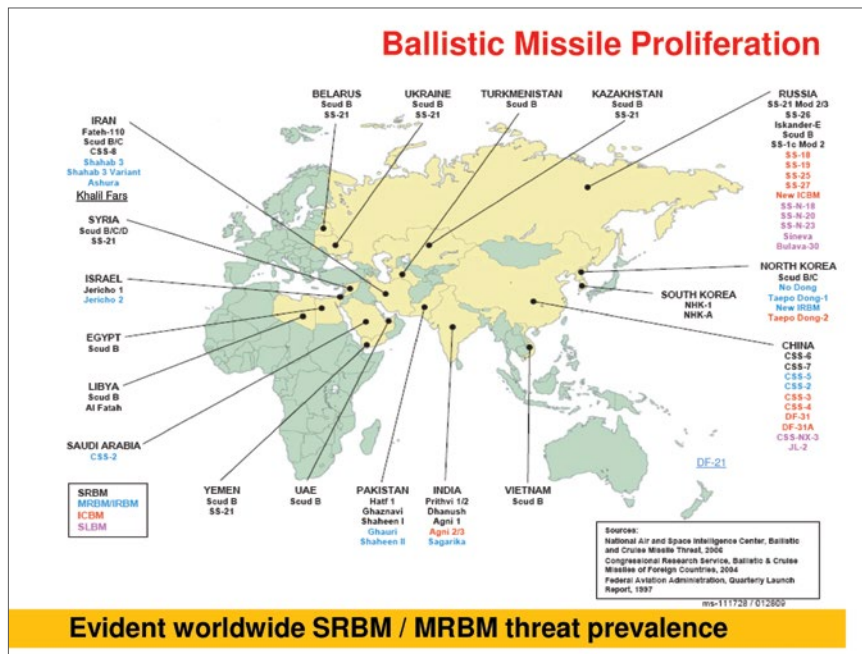
software, within CMS Orizzante UC-7. ET3 is going to be finalized within autumn 2014.

MBDA Ballistic Missile Defence Activities

MBDA's Aster achieved the first ever successful interception by a European missile of a target simulating a ballistic missile threat and to offer a European contribution to NATO ballistic missile defence programme. Aster is primarily operated by France, Italy, and the United Kingdom and is an integrated component of the PAAMS air-defence missile system, known in the Royal Navy as Sea Viper. As the principal weapon of the PAAMS system, Aster equips the Type 45 destroyers and the Horizon class frigates. Aster also equips the French and Italian FREMM multipurpose frigates, though they will not be operating as part of a PAAMS air-defence suite. The Aster missile series, comprising the Aster 15 and Aster 30 are a family of vertically launched surface-to-air missiles.

Although The Aster 30 is anti-ballistic missile capable, with its 3 different variants, Aster 30 Block 1, Aster 30 Block 1NT and Aster 30 Block 2, MBDA has enhanced its Ballistic Missile Defence capabilities.

Aster 30 Block 1 has ground-based wide area defence capable against 600 km-range ballistic missiles. System has already successfully tested 3 times with real



Evident worldwide SRBM / MRBM threat prevalence

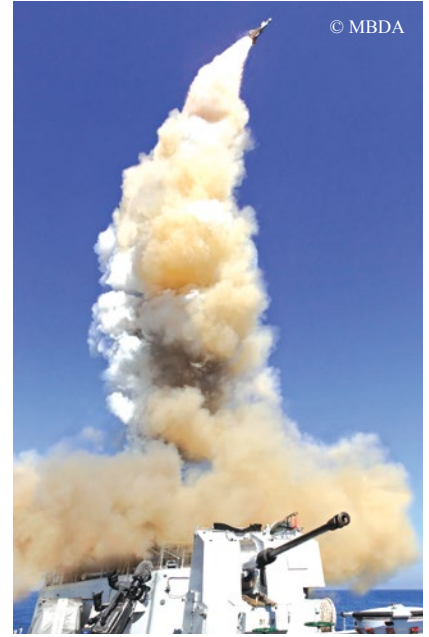
engagement of Short Range Ballistic Missile targets. It is used in the Eurosam SAMP/T system operated by the French Air Force and the Italian Army .

Aster 30 Block 1NT (New Technology) will be able to intercept ballistic missiles with a range up to 1000 km. It has a lower layer capability providing enhanced capability and force protection against theatre Ballistic Missiles with regard to Aster 30 Block 1 and improved seeker to increase system capability. It is compatible with existing Sylver A50 launcher.

Aster Block 2 with Hit-To-Kill capability and exo-atmospheric capability, is currently being developed. It maximizes the protection of sensitive zones and deployed troops against the whole spectrum of ballistic and air breathing threats and uses a complementary high altitude interceptor operating in the upper layer to cope with evolved ballistic

threats (SRBM and MRBM). It will feature significantly enhanced ballistic missile Defence and has a wide area defence capable against 3000 km-range ballistic missiles. Moreover it is designed as an evolution of ASTER Capability and provides a potential contribution to the upper layer of NATO BMD. The first Aster Block 2 is expected to deliver after 2020.

The UK and France have agreed to strengthen defence co-operation in Anglo-French Brize-Norton summit held on January 2014. According to the final declaration, 2 nations have decided to launch a bilateral dialogue on Ballistic Missile Defence (BMD). This would include analysis of the potential to develop a longer range BMD role for the MBDA Aster missile. This work has synergies with the "One Complex Weapons" initiative which aims to coordinate the development and acquisition approach that eliminates duplication in the industrial base.



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On the other hand, France Parliament has voted 250 M€ for the development of Aster B1NT in this year's budget.

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New Horizons In Seaborne Platforms' CBR Defence

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Proverb

Besides all prohibition and restriction struggles available, especially chemical and biological weapons are kept on being produced, developed and stored as a power indicator against other states, a balancing element for deficiencies of conventional weapons and tool for blackmail. Easy production and being cheap of CB weapons is a dominant factor in this regard.

The popularity of chemical weapons, signed in literature as “no enemy” and means of delivery that is easy to produce and provide extra advantages for terrorists has augmented nowadays. Remarkably regional developments and mobility trigger this issue. CB threat is anticipated to increase gradually in time and in upcoming near future.

The current global CBRN reality is both a high probability and high upshot threat with potential consequences with mass casualties and massive destruction not only for nature but also for biosphere. This hazard is augmented by the new elements of CBR proliferation means and may well extend far beyond the present generation.

Easier accessibility and more complex detection of backstairs CBRN stockpiles authorize a steady state of alert and training to face the outcomes in terms of tactical warfare and CBRN terrorism.

Land Note;

..... **Vegetating on Land Insidiously with CBR Attire... 4x4 YALÇIN ARV**

Combating against “CBRN Hazardous Challenge / Crises Environment” is dominating parameter of survivability for current Defence requirement authorities.CBRN stinking environment requires couple of tools that need to be driven through aware and responsible CBRN technology.

Through her long voyage in defence industry NuroI Makina has accumulated quite standing CBRN data and talent.

CBRN Reconnaissance Vehicle (4x4 YALÇIN ARV (tailors itself in different



combinations of customer requirements and needs));

- › Is very recent achievement of NuroI Makina,
- › Is assertive in its lane for being nominated as regional/global trade-mark in near future,
- › Gives depth to the battlefield, is alerting, is quite functional within scope of detection and identification of CBRN threat, is sampling capable, is partially analyzing and early warning capable and is also supporting C&C parameters,
- › Enhances intervention capability of security forces and also eliminates the combat field operational requirements of army in terms of mobility, interoperability and tactical maneuverability with its multi-purpose tactical design,
- › Copes with theatre, urban, cross-country and combat field CBRN reconnaissance requirements,
- › Minimizes the reaction time in case of emergency/threat,
- › Augments CBRN capabilities.

And then...Naval CBR...

Asymmetric challenge area and proving ground dynamics encompass diverse multi-dimensional algorithms than it used to be, so naval glance needs

to be more focused to CBR issues as there is no hurdle in open seas to obscure sea platforms in terms of CBR threat,obviously will affect the swimming body more than it does land platforms in theatre.

CBR infected wet environment surrounding requires dressed naval platforms when it comes to sea. Handling / Managing “CBR Infected Seaborne Crises Environment” is another highlight of survivability for current military naval requirements as well as relevant authorities including civil platforms.

Current Naval CBR Threshold

Scientific, technologic and operational studies regarding defiance of sea platforms against CBR threats recently have populated fairly and so, generation of seaborne and under sea platform CBRN defence and detection / identification, sampling, decontamination and medical CBRN systems have been commenced.

Latest and recent developments in CBRN defence domain, meaningly through enhancing / boasting of seaborne platform CBRN filtration systems with CBRN detection systems,



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a surviving CBRN architecture concept has been catalized and seamen/crew would have been protected against either aerial or naval CBR contamination.

Joint operational requirements compel technology to concentrate on the issue regarding positive and moral motivation contribution of conducting CBR detection on troops in combat field/operation area by handling/assisting of naval and aerial units together with (in addition to) land forces. Stand-off detection systems due to changes in spread and reflection throughout offshore, currently do not introduce a satisfactory detection / identification potential on naval platforms technologically. R&D studies on this field still survive.

Technically, seaborne and submarine platform stand-off detection are still under development and study. The reflection feature of sea water puts negative effect on current relevant studies. On this regard many countries content themselves just with CR point-detection capability on seaborne platforms at present. Stand-off detection in terms of CR still stands as deficiency.

TICs/TIMs Detection Requirements

TICs / TIMs are toxic industrial and material produced, stored and transferred/carried to different regions worldwide. These can be in gas, liquid or solid phase. It's also possible to perceive these as industrial materials to be used for intent to harm men for use of ugly purposes, transferred, produced and, concealed by storing for later use.

It's been tolerated for long the probability of use of toxic chemicals produced for legal purposes in big quantities for different causes. TIMs are currently in use, produced by arming countries without subjecting any sort of important restriction and in a form to be used as warfare agent in time.

TICs / TIMs detection is quite important especially for warning and investigating of exposure levels of ships waiting for new tasks in base and port also during international tasks as to proliferating of toxic gases through environmental factors and facilities around. Especially, it is important in case of addressing contamination of cruising ships carried by sea and air in terms of early warning and detection.

Food for Thought regarding CBR Requirements in Seaborne Ambiance

Operations in sea environment has a peculiar methodology and especially is a operation with high sacrifice level that requires high sustainability of combat effectiveness with moral & motivation level high, vigorous and dynamic personnel.

Should maritime operations, in CBRN environment is a concept itself and a whole activity that requires additional protection and security measures.

Either in combat conditions or in crisis period or in peace time, whether while cruising and/or in port position CBRN defence measures are rather important and requisite in terms of naval force tasks/responsibilities that need to be achieved/accomplished in time and uninterruptedly.

In terms of resources provided by CBRN technology portfolio available to CBRN defence dynamics in naval platforms have proved clearly the need for equipping naval platforms with alike systems in land platforms but in compliance with sea conditions and countries have tried to meet their CBRN atony in terms of emerged relevant awareness.

The major determination on this frame is a complete/total solution perspective including CBR detection/identification, sampling (liquid), decontamination, CBR first aid architecture, instead of so far perceived CBRN filtration is the unique way of defending CBRN conceptual approach. The good thing is that the recognition of this system solution by civil/military authorities.

This awareness happened to commence implementing of new precautions in this regard and, bring about showing attention to CBRN defence issues in their all new platforms. Integration of CBRN systems to the ships/submarines in their inventory gradually is an important indication.

As naval platforms are highly vulnerable especially during port position, maritime operation close to shore and while passing through narrow channels, this point needs to be considered significantly in terms of CBRN Defence.

Peace Time Naval CBR Reproofs

State of peace is the most ideal process for completion of restructuring concordant to CBRN concept. This process is the most convenient time for either removal of deficiencies in current systems or integration of new

CBRN systems to be integrated to naval platforms,

CBRN training of ship crew is utmost importance during this process. Particularly, user training is very valuable for defending against threats to be introduced during crises and combat time.

Naval platforms during this process especially in port position either in bases or abroad port visits CBRN terrorist attacks need to be considered, active / passive defence precautions required need to be enhanced by appropriate CBRN equipment and material.

Naval CBR Jinx During Crisis

Joining the operations with CBRN capable platforms that will participate as part of a whole in international ambiance and compatibility of this platform with others is quite important. Terrorist CBR attacks are the most important topic to be seriously considered during crisis.

CBR Survival During Cruising

It is requisite and ultimate importance for mission accomplishment having the advantage of available CBR detection / identification systems, decontamination system addition to filtration system available to cope with CBR threat especially during cruising in/under international waters that had been contaminated by means of aerial and sea tools.

During cruising in/under international waters defending against any sort of CBR threat is seemingly not possible without equipping with CBRN materials like protection, sampling, decontamination assets other than filtration systems.

CBR Handling in Port Position

In such a circumstance there is required to be taken measures regarding possession of all CBRN system dynamics required to meet operational needs relevant to CBRN side for mission accomplishment, to back up the system, to settle the requirement issues, function 24 hours base and be possessed these systems.

This subject need to be enhanced together with a good quality training. Port position is the most vulnerable time for ships. On this regard, CBRN measures need to be under control and be tight in hands either during unloading, loading or exchange of personnel.



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Naval CBR Defence Under Combat Conditions

Measures during combat, cruising in/under open seas and port position under CBRN threat condition, are not habitual due to unawareness, but it is possible operation kind that naval units and platforms will come across in near future.

Such environment draws a picture including; functioning filtration systems in total, laboring CBRN detection systems willing to catch threats, requiring IPE dressing in terms of mission persistency, increasing sampling requirements, high level decontamination need.

Preparedness for such photograph and reality and taking necessary measures will be an argument of confrontation for naval units in future sea combats during embodiment of battle/crisis environment as an inevitable incumbency/exigence.

Operation/mision in such environment could only be accomplished/achieved through having a naval platform equipped with high level CBRN training and CBRN equipment due to current naval defence concept.

Highlights

CBR detection system integration to naval platforms currently has not been restored a standart form in terms of either technological and conceptual norms. Relavent designs may change due to size of naval platforms and individual design concepts of companies.

Currently in this sense few companies worldwide collect their and/or other companies' products and

design "Naval CBR Detection System" and market this system by supporting it with a software.

Naval CBR system architecture tailored by NuroI Makina in terms of integrity in compliance with military operational concept in/under sea environment meets all parameters of CBR technology and predicts CBR functional&operational requirements that allows conditions of today and provides more advantage of integrity / superiority / compatability / sustainability / survivability, in addition to protection.

Meeting the naval CBR conceptual/ operational requirements is the most important issue and, thus this note needs to be considered seriously and within the system the required precision be drawn.

The configured architectural design is unique and celerity/sustainability / maintenance / contribution to operation/ continuity / ease of use/ being decorated with units of modular structure and having access to any sort of enviroment use must be considered as high importance.

CBR detection system that will be integrated to naval platforms haveto be designed, developed and configured in compliance with sea enviroment operation concept and CBR architecture that will meet operational needs of naval platforms through consideration of currently available military tactic, technic and operational region dynamics.

Naval CBR systems need to be targeted to be tailored with a design and integration architecture that will complement and support already existing CBRN filtration system in naval platforms.

Naval Vulnerabilities and Deficiencies against CBR

Comprehensive joint operation enviroment requires conducting of strategic seaborne surface and under sea transfer and movements. In general terms during these operations "ports" and "naval platforms" are bound to be adressed as the most vulnerable ambit for CBRN issues and threats.

CBRN, perceived to be a threat for just land units so far, today also emerges as an important threat and Defence requirement parameter for all world state naval platforms and forces due to increasing amount of naval operations, doctrinal changes/developments and especially due to augmenting importance of joint operations.

Nowadays, it is inevitable to expose the effects of sea water and/ or contaminated aeresol clouds during sea and under sea cruising of oversized sophisticated naval platforms with crew and equipment. Even dreaming, actually appeals man what sort of things may be faced by seaborne platforms, unaware of CBRN threat, with no relavent training or CBRN defence systems.

NuroI Makina New Seaborne CBR All-Day Wearing

During her long coverage in Defence Industry NuroI Makina accumulated quite dominating CBR technologic data and talent for role sharing and addressing peculiar horizons by convincing her naval CBR repelling expertise and talent master.

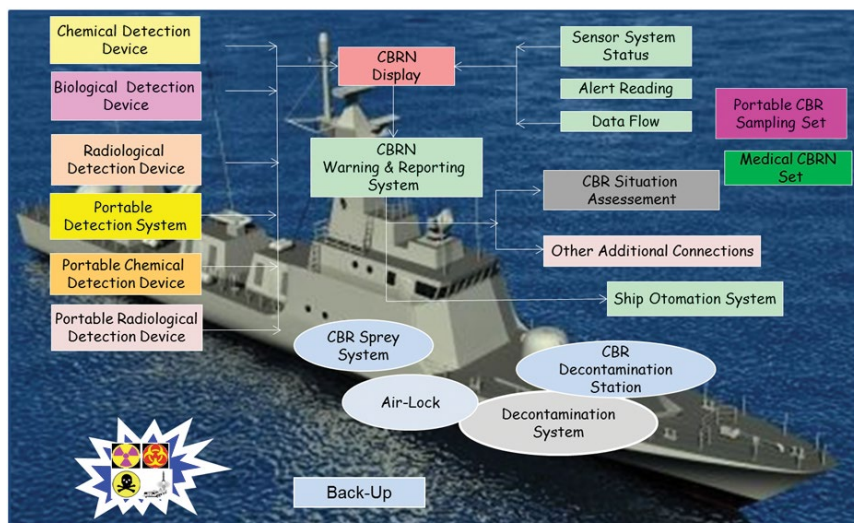
NuroI Makina, by scrutinizing global/ regional and national CBR picture/ perception, has decided to set up a new path in terms of restructuring of her CBR naval talent and experience due to emerging requirements and deficiencies in some specific domains regarding naval CBR requirement tools.

NuroI Makina CBR perspective actually bases on "design, system integration and configuration" dynamics. NuroI Makina envisages fulfilling "Naval Military & Civilian CBR parameters" regarding "filtration, detection & identification, alarming, warning & reporting, decontamination, sampling and medical CBR" in naval combat theatre and challenge areas.

NuroI Makina CBR System Architecture has been designed due to CBRN concept and character in system consistency.

Methodologies and devices being used in system integration and optimal

Naval Platform NMS CBRN System Solution



high level security parameters and CBRN protection procedures for ship crew have been designed/adopted through consideration of current military / civil standards.

CBR System has been architected as to cope with functional requirements of CBR contaminated and exposed crew, alerting of ship personnel and available CBR threat in combat and peace time and also either in port or cruising position.

CBR System has been designed with back-up savvy and based upon perpetuity and attributed to a concept to fulfill and support each other in case of defects and hardship in terms of mission accomplishment.

CBR System is aimed to complement current ship filtration system and to function in integrity and conformity.

CB detection devices are mounted inside ship platform and outer CB agents are caught through probes and sampling line, thus sound detection and protection against outer effects is being accomplished

All of radiological detection devices are mounted to sea wall outside citadel (Front-Back-Left-Right), thus

asymmetric coverage is set.

Nurol Makina CBR System is envisaged to warn and alert relevant ship units by implementing perpetual CBR monitoring and detection.

TIC / TIM / TIR / TIB monitoring is breasted by talent devices.

Nurol Makina Naval Platform CBR concept overarches a Portable CBR Detection Device that copes with suspected leaks and inside platform contaminations for enhancing / augmenting CBR system available. This portable system not only backs up current CBR architecture but also catalyze outer detection requirements during port and cruising positions.

To combat against sea water contamination detection issue Nurol Makina design is architected with portable CBR sampling unit, thus an infrastructure for CBR analyze and further laboratory identification methodology is generated. Most remarkable & functional indicator for the system can be evaluated as CB sampling.

In terms of Medical CBR as a complementary piece of total CBR

system design CBR Medical First Response Set is provided for first aid requirement after decontamination procedure to CBR exposed crew.

Portable decontamination system enables intern and outer ease of use is also envisaged to increase CBR functional capability for decontamination of shipmen from CBR dirt in case of need. This system is enriched with required disinfectants that allow way for mission accomplishment and sustainability of exposed crew.

Nurol Makina Deco System Architecture also married with capability for managing aerial platform and equipment decontamination talent with its accessories. Any individual crew is considered to have its own deco kit.

CBR Spraying System is also taken into account. CBR Spraying System is envisaged to cope with equipment, material, ordnance and other system equipment on deck by wetting, washing and cleansing so decontaminating. Preventive spraying of surfaces prevents CBR agents to sink and cling to deck surface and provides CBR clear shipboard.

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AeroVironment Intends for Altoy to Become a High Technology Company in Turkey

Mr. Roy Minson, Senior Vice President of AV Inc and General Manager of UAS evaluated AeroVironment's core capabilities, products and expertise, its position amongst global defence industry companies, Global Observer (High Altitude Unmanned Air Vehicle), cooperation with Turkish defence industry and their investment in Turkey for Defence Turkey Magazine.

Defence Turkey: Could you please inform us about overview of your company, core capabilities, products and expertise?

AeroVironment is the world leader in small unmanned aircraft systems (UAS) with more than 85 percent of the U.S. Department of Defence unmanned aircraft fleet, more than one million flight hours and more than 30 international customers. The company is also a leader in plug-in electric vehicle development and charging solutions. In the mid 1980's, AeroVironment invented the hand-launched UAS for delivering better information, on-demand, directly to those who need it, and we have spent the past nearly three decades enhancing our technology.

AeroVironment is a technology solutions provider that designs, develops, produces, supports and operates an advanced portfolio of Unmanned Aircraft Systems (UAS) and electric transportation solutions. The company's electric-powered, hand-launched unmanned aircraft systems provide powerful actionable information to military, public safety and industrial customers around the world through real-time, airborne imaging, sensing and communication.

RQ-11B Raven, RQ-12 Wasp, RQ-20A Puma and Shrike VTOL comprise AeroVironment's Family of Small Unmanned Aircraft Systems. Operating with a common ground control system (GCS), this Family of Systems provides increased capability to the warfighter that can give ground commanders the option of selecting the appropriate aircraft based on the type of mission to be

performed. This increased capability has the potential to provide significant force protection and force multiplication benefits to small tactical units and security personnel.

AeroVironment provides logistics services worldwide to ensure a consistently high level of operational readiness and provides mission services for customers requiring only the information its UAS produce.

Recently we joined forces with Altoy Defence Industries and Aviation Inc., a Turkish company, to strengthen our commitment to Turkey and neighbouring markets.

Defence Turkey: How do you evaluate your position amongst global defence industry companies?

As I noted previously, AeroVironment is the undisputed world leader in small UAS. The company has delivered nearly 25 thousand air vehicles to the U.S. Department of Defence and more than 30 allied international customers. The U.S. military has conducted a total of five competitive procurements for small UAS programs of record, each of which included the largest global defence companies, and AeroVironment has won all of them. We believe that all military forces among U.S. allies can benefit from small UAS, and that the potential market opportunity is large.

We also continue to develop new products that create new categories, much like our small UAS Family of Systems accomplished. One



example is Switchblade™, a tactical missile system designed to provide a rapid, lethal, pinpoint precision strike capability with the ability to avoid harming bystanders. Within minutes, the back-packable Switchblade can be launched to provide the warfighter with a precision strike solution without collateral effect. Switchblade is changing the game on the battlefield and saving lives.

Global Observer is a technology breakthrough: a hybrid-electric, stratospheric UAS designed to provide affordable, persistent reconnaissance and communication over any location on the globe. Global Observer benefits from our more than 20 years of technology leadership in this area.

Defence Turkey: Could you please inform us about the technological competence of Global Observer (High Altitude Unmanned Air Vehicle)?

Global Observer is a liquid hydrogen-fuelled, hybrid-electric unmanned aircraft designed to provide affordable and persistent communication relay and surveillance. Each aircraft is designed to fly in the stratosphere for days, longer than any other airplane in history. A system of two air vehicles will trade-off position above any spot on the globe to provide seamless coverage, like a geosynchronous satellite. Global Observer offers up to a 600-mile diameter of coverage with multi-payload capacity and flexible payload integration options. It has a wingspan greater than that of a Boeing 767, yet it weighs about as much as a full-sized sports utility vehicle. Global Observer uses liquid hydrogen as fuel because it has multiple times the amount of energy per kilo than regular fuels. Its all-composite structure makes the aircraft very light, yet very strong. Global Observer produces only water vapor as its emission.

You can think of Global Observer as a stationary atmospheric satellite operating at a fraction of the cost of



Puma UAS



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Global Observer

satellites and other systems. This capability does not exist today from satellites, manned or unmanned aircraft.

Global Observer is an extension of two decades of developing and demonstrating inventions that make long flight endurance at high altitude possible. AeroVironment's technology is uniquely qualified to deliver a breakthrough solution like Global Observer.

Defence Turkey: How do you assess your position in Turkey?

We are committed to working with our Turkish partners to contribute to world-class solutions being developed in Turkey. These strong relationships with Turkish partners can benefit the defence industry and provide a valuable capability to the Turkish Defence forces. We believe international export opportunities have the potential to emerge over the longer term. AeroVironment's long history in developing advanced electric vehicle technology solutions may also be applicable in Turkey.

AeroVironment and Altoy Defence Industries and Aviation Inc signed a

MoU with Turkish Leader Defence Company, Aselsan at the beginning of June. Could you please inform us about the scope of this cooperation?

Our cooperation with Altoy and Aselsan continues to gain strength as we work to identify opportunities that lever each company's experience, knowledge and key capabilities. The MoU addresses Global Observer, but we are exploring additional areas such as commercial pipeline monitoring. We are already working with Aselsan to supply sensor systems to monitor pipelines for one of the world's largest oil and gas industry.

Defence Turkey: It is known that your company made an investment in Turkey. What will be the main activity of this facility? When will you start the manufacturing?

We see our physical activity in Turkey being led by Altoy Defence Industries and Aviation Inc. Altoy employs key personnel in Ankara and we hope to see their employment accelerate in the coming months and years. We have already made investments in establishing the JV company and we look forward to a long-term, productive presence in Turkey that benefits our customers, our partners and the Turkish economy.

Defence Turkey: What is your approach on 3rd markets activities? In which markets your new establishment in Turkey will take role? What will be the scope of your activities in these regions?

As I indicated earlier, the demand for our products and services is global in nature, in use by many customers. We see Altoy as a key anchor in this region that enables us to deliver innovative solutions to new customers.

Defence Turkey: Could you please inform us about your cooperation with other Turkish companies and Turkish Authorities?

We are in discussions with several Turkish companies of varying size. We believe Turkish industry has a great deal to offer to improve our existing and future products and services and we believe we provide uniquely valuable solutions that can benefit Turkey, making our participation in this market mutually beneficial.

Defence Turkey: Would you like to add something and give a message to our readers?

Turkey is an important nation, and possesses extensive and growing aerospace and defence industrial infrastructure. We believe that our cooperation in Turkey will provide added value to the Turkish defence industry. We intend for Altoy to become a high technology company in Turkey, just as AeroVironment is in the United States.

We believe that our strong technology capabilities and innovations, together with Turkish companies, can create the potential for Altoy to be a leading actor in the region. ■



Mr. D. Halit Yılmaz, President & CEO, Altoy Defence Industries and Aviation Inc., Mr. Roy Minson, Senior Vice President, AV Inc, General Manager, UAS

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Global Observer, HALE Class UAS

Unmanned Aircraft System Overview

Global Observer (GO), is a High Altitude Long Endurance (HALE) unmanned aircraft system (UAS). It combines the best attributes of satellites and both manned and unmanned aircraft. From the stratosphere Global Observer will act like a 12-mile-high, redeployable satellite to provide coverage over an area of up to 600 mile in diameter. Every GO component is designed for maximum flexibility and flight endurance – 3 to 4 times that any other fixed wing aircraft. A revolutionary liquid hydrogen-fueled propulsion system, coupled with extremely light but durable airframe, enable significant benefits and capabilities never thought possible. A single tank of fuel is enough for 7 days of endurance. A SIXTY-SIX tons of Fossil Fuel consuming mission can be achieved with just ONE ton of Hydrogen Fuel.

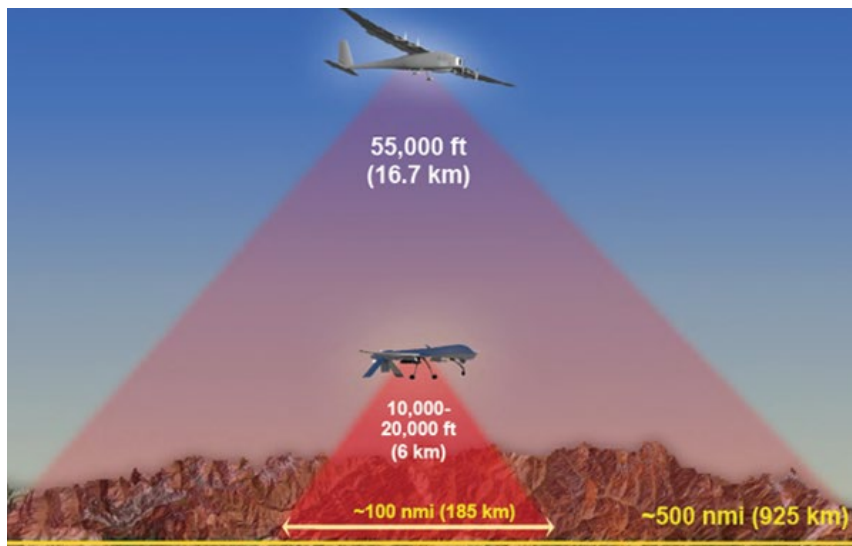
Mission Possibilities

› Communication Relay

With 53,5 wind span (wind span of Boeing 737 is 34,32 meter), GO offers satellite-like capabilities to enable affordable, persistent and seamless communications relay capabilities where mission operators need it most. GO can provide more bandwidth to interconnect and route data. Teams separated by topographical barriers and using legacy radio equipment with disparate radio frequencies and signal formats can use communications relay to communicate with each other and to distant command centers in real time.

› Disaster Response

GO provides hurricane storm tracking, weather monitoring and sustained support such as evacuation, planning, relief operations and first response coordination. With an advanced payload, GO can provide alternative communications relay in the event assets such as cell towers,



microwave relays and satellite downlinks are damaged.

› Maritime Operations

Thanks to its adjustable cameras and sensors which provide coverage of about 1,000 km in diameter, GO can provide long-term surveillance over coastlines for detection of intruders or transport of illegal goods. This enables command center to obtain real time intelligence data to observe suspicious activity, determine patterns of behavior and identify threats to enable rapid and effective countermeasures/actions.

AeroVironment Inc., California USA

AeroVironment has over 30 years of experience in UAS industry. AV employs nearly 800 people in its Research and Development Department, 10% of the personnel are Ph.D. holders. AeroVironment, a worldwide technology solutions provider and leader in unmanned aircraft systems, is fully

capable of providing the infrastructure to design, manufacture and test Mini, Tactical and High Altitude unmanned aircrafts.

AeroVironment Product Range

NASDAQ: AVAV

Over 25.000 UAS delivery

Export to 27 Countries

UAS Market Share in USD: % 85

AeroVironment holding the 85% of UAS market share (Figure 1), has manufactured Global Observer to meet the increasing demand in UAS industry. During the decade prior to the initial flight testing of GO, AeroVironment had manufactured two former HALE UAS. Namely, Pathfinder which reaches 80,000 feet and Helios, holding the world record for an altitude of 96,986 feet. Consequently, GO has emerged from the know-how gathered from these two systems (Pathfinder and Helios) along with 700 Million \$ of investment and 10 years of experience.



© AeroVironment

Specifications	
Features	Stratospheric Unmanned Aircraft System
Payloads	Up to 400 lb. (181.5 kg), max. 800 lb.
Endurance	5 days, upgraded version 7 says
Operation Altitude	55.000 ft., upgraded version 65.000 ft.
Wing Span	175 ft. (53.3 m)
Length	70 ft.(21.3 m)
Propulsion System	LH2 powered Internal Combustion Powerplant driving four high efficiency (98%) electric motors.

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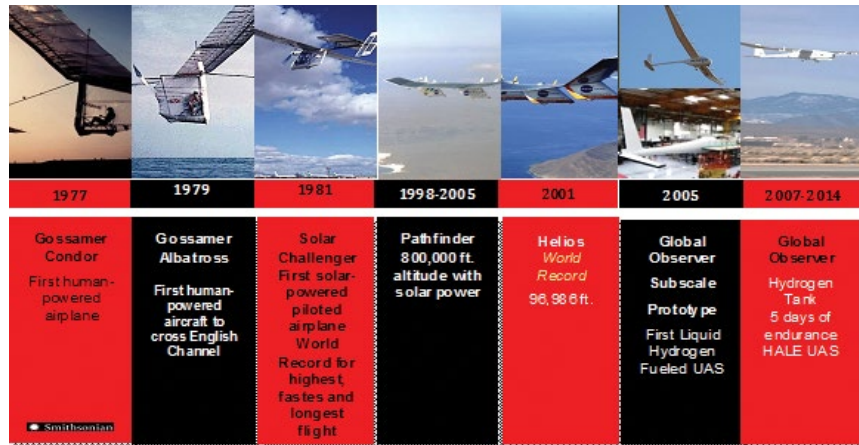
Altoy Defence Industry and Aviation Inc.

Altoy Defence Industry and Aviation Inc. is a Turkish Company was established under the provisions of Turkish Commercial Code on February 7, 2014 as an affiliation of AeroVironment, Inc. (USA) (49% shareholder).

Altoy aims to develop & manufacture HALE (High-Altitude, Long-Endurance) Unmanned Aerial Platform jointly in Turkey by transferring the high technology from AeroVironment, marketing and sales of such products to the world market, test, operate, maintain and repair of HALE Platforms.

For technology transfer, research, development, manufacturing purposes Altoy has a facility of 19.000 m² with a hangar of 5000 m² in Ankara Kazan (Next to Aerospace Cluster). The headquarters is located in Ankara Cukurambar in its early establishment and expected to expand in the future.

Altoy also has the exclusive rights of joint manufacturing, marketing & sales of HALE Products of AeroVironment Inc. (Holds 85% of unmanned aircraft system market of the US Armed Forces) to the hinterland of Turkey including nearly 20 friendly States. It is estimated that this initiative will contribute to technology transfer in both platform and component bases and foster the supply in the national aviation industry.



Altoy's Vision is to become the leading global player in the field of High Altitude Long Endurance (HALE) Unmanned Aerial Systems and the Research & Development center of relevant high technologies, to manufacture & maintain such systems.

High-Tech Global Observer, Stratospheric HALE UAS key features are as follows;

- > Propulsion with Liquid Hydrogen Fuel System
- > 400 lb. of Payload and Sensor Systems Capacity
- > 65,000 ft. operation altitude
- > 5-7 days of endurance at high altitudes

Liquid Hydrogen Propulsion system is a new cutting-edge technology which provides extensive lightness and

efficiency. In an air operation, 1 ton of liquid hydrogen almost is equal to 66 ton fossil fuel efficiency. This saves a considerable amount of fuel consumption and provides a longer duration, up to 7 days. It is expected that new technology and research would improve upon duration and distance performance.

Altoy UAS has operational capabilities such as; Defence, Border Security, Surveillance & Reconnaissance, Search & Rescue, Security of Energy Lines and Fields, Intelligence Gathering, Agricultural Analysis, Fire Prevention, Wide-Band Data Communications, Datalink & Relay.

Altoy takes its name from the largest flying bird of Turkey, Great Bustard (Otis tarda), Toy (in Turkish).

Roketsan and SAAB Working Together For Global Market On "Anti-Tank Missile System"

Roketsan and SAAB Dynamics AB have signed a Memorandum of Understanding at Eurosatory 2014 Exhibition taking place in Paris, France covering future collaboration on Anti-tank Missile Systems.

Under the terms of the agreement signed the two companies will work together to develop a new system to fill the gap in the short to medium range Anti-tank missile market.

The MoU was signed by SAAB Vice President and Head of Business Area Dynamics Mr. Görgen Johansson, and Chairman of the Board of Roketsan, Dr. Eyüp Kaptan.

Dr. Eyüp Kaptan said: "We look forward to explore a new system to leads us to Global Market together with SAAB. In this manner, investigating cooperation opportunities including the



marketing of our weapon systems will be our main converging driving force. We hope the result of this initiative will lead to a broader business cooperation in the future between the two companies."

Mr. Görgen Johansson said, "We see a great potential in a future cooperation with Roketsan in the Anti-tank market and look forward to further exploring the possibilities together in this partnership."



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Developing Cooperation Between Military Academy Command (KHOK) and Aselsan

Turkish Armed Forces' most significant national resource Aselsan and Turkish Military Academy that trains Turkish Army's distinguished officers will be collaborating on scientific projects.

The Cooperation Protocol was signed by Military Academy Commander Major General Yılmaz Uyar and Aselsan's Chairman of the Board Dr. Hasan Canpolat at a ceremony.

Major General Uyar noted that with the Protocol, the postgraduate and doctorate studies conducted at KHO gained more meaning and continued, "We are speaking of a brainpower of 400 people here. And all of them are working to meet the demands of Turkish Armed Forces. We have 6 research institutes within the structure of our Academy. We are forming a structure that is aware of its operational needs and reflecting them onto the defence industry. Merging the capacities of our Academy and Aselsan will bear fruitful results for our Armed Forces".

Dr. Hasan Canpolat extended a brief speech at the ceremony and said, "Aselsan's principle capital is qualified a work force. Therefore, each defence industry investment made in our country could well be considered as our capital. From this point forth, as Aselsan, not only we support our own personnel's graduate and postgraduate studies but also we contribute to training of qualified work force besides



Military Academy Commander Major General Yılmaz Uyar, Aselsan's Chairman of the Board Dr. Hasan Canpolat

Aselsan with our doctoral fellowships. I believe that this Protocol will greatly contribute to the development of cooperation between the institutions as well as covering the demand for qualified work force in our country".

Defining the conditions of cooperation regarding training and scientific research between KHO and Aselsan, developing the joint thesis and project studies related to postgraduate studies, identifying the principles regarding the academic studies of KHO Defence Sciences Institute (SAVBEN) students on technical issues are taken into consideration with the Protocol. According to the Protocol, thesis subjects may be suggested by Aselsan

to SAVBEN postgraduate students on subjects related with Aselsan's area of interest and these suggestions may be updated if required.

Through a mutual covenant on special areas, SAVBEN will offer postgraduate trainings to Aselsan's personnel and these postgraduate studies may be conducted as simultaneous/formal distant trainings. If Aselsan demands academic and scientific support, such support shall be provided within the bounds of responsibility and related legal regulations. The institute will encourage the postgraduate students to select subjects within Aselsan's field of interests.

Thales Group to Use Aselsan Modules for Radars

Thales, one of the world's leading defence companies, will be procuring the transmitter/receiver (T/R Modules) from Aselsan in order to use them for the production of SMART-S Mk2 3-D Research Radars that are being utilized by many Naval Forces throughout the world. The first order composed of 100 T/R Modules has been received and Aselsan will be starting the deliveries in 2015.

T/R Modules enable active phased-array antenna radar systems' transmission and reception of signals



with the state-of-the-art technology. Design of such modules requires high-level engineering capacity while

their production involves specialized manufacturing infrastructure and background. Aselsan has been developing and manufacturing microwave modules that are used in new generation radars and electronic warfare system structures for over past ten years. The T/R Module product range has been developed within this respect and they appeal various radar systems with their diverse frequency bands. Aselsan's T/R Modules stand out with their advantages in both cost and performance aspects.

Aselsan, AeroVironment and Altoy Defence Industries and Aviation Inc. Agree to Collaborate for Turkish and Other Markets

The Turkish defence industry leader, announced it signed a Memorandum of Understanding on the 6th of June, 2014 with AeroVironment, INC., a worldwide technology solutions provider and leader in unmanned aircraft systems, and Altoy Defence Industries And Aviation Inc., a Turkish joint venture partially owned by AeroVironment. The agreement establishes the first step towards future collaboration on civil and military avionics, electronics and electro-optical systems, sensors and communication systems. Solutions for Intelligence Surveillance and Reconnaissance applications such as electro-optical cameras, avionics and communication systems for AeroVironment's "Global Observer – High Altitude Unmanned Air Vehicle" would be developed and presented to target international markets by Aselsan.

By working together through this agreement, the parties aim to access

new markets and explore potential opportunities in multiple countries.

Aselsan Vice President and MCEO Division CEO Mr. Özcan Kahramangil said: "In addition to its leading role in the Turkish electronics industry, Aselsan will achieve a broader product range and greater access to global markets through its relationship with AeroVironment and Altoy Defence Industries and Aviation Inc. We believe that the synergies generated through this collaboration will deliver innovative solutions and create a notable distinction of worldwide success to the parties."

AeroVironment Senior Vice President Mr. Roy Minson stated: "We look forward to a successful collaboration with Turkey's leading defence electronics company to deliver uniquely valuable solutions that produce successful outcomes for customers. We believe that



opportunities exist for our companies to expand our markets with competitive products and solutions for Turkey and export markets.

The President of Altoy Defence Industries and Aviation Inc., Mr. D. Halit Yılmaz declared: "The collaboration will create innovative solutions to the expanding global markets and leverages the companies to worldwide scope."

FNSS MILDESIGN 2015 International Land Vehicle Design Competition

FNSS Savunma Sistemleri A.S. (FNSS Defence Systems Inc.) the armored combat vehicle manufacturer of Turkey, is organizing the second FNSS MILDESIGN International Military Land Vehicles Design Competition.



FNSS Savunma Sistemleri A.S. (FNSS Defence Systems Inc.) the armored combat vehicle manufacturer of Turkey, is organizing the second FNSS MILDESIGN International Military Land Vehicles Design Competition.

The purpose of the competition is to assist in raising designers for the Defence industry, introducing

young designers to professional circles and to support the activities in the development of indigenous products in Turkey. The competition, which is organized in two categories namely the "Professional Category" and the "Student Category" is taking part among the reputable design competitions in Turkey and in the World with its scope, criteria, awards Selection Committee. 45 professionals and 20 students have participated with total 65 projects in the nationally held FNSS MILDESIGN 2011 competition. Due to the deep interest shown to FNSS MILDESIGN International Land Vehicles Design Competition, it is planned to continue organizing it biennially.

It is considered that FNSS MILDESIGN 2015, the subject of which is specified as conceptual design of a manned and remote controlled modular military land vehicles with ballistic protection, is an important step in terms of making use of professional designers potential.

With the aim of realizing another successful organization with its selection committee, advisory committee and organization committee consisting of members who are experts in their field and who come from different disciplines in the area of design, FNSS wishes success to all competitors in FNSS MILDESIGN 2015 International Land Vehicles Design Competition.

Turkish Defence Industry Participates in Force at Eurosatory 2014

Eurosatory 2014, the Land and Air-Land Defence and Security Exhibition, was held in Paris between the dates of June 16 and 20, 2014. A trade show of world acclaim, this year's Eurosatory 2014 had six new countries exhibiting; the show more than answered the expectations of professional visitors and governmental officials. The show had 1,504 exhibitors from 58 countries, and more than 55 thousand visitors. Eurosatory 2014 hosted 172 official visits from 88 countries across its grounds of 175,000 m². Exhibiting companies showed the latest technologies in land and air-land systems.

Total of 36 Turkish Companies Exhibit at the Show

The Eurosatory ranks among the top five shows for the defence industry. This year, a total of 36 Turkish companies participated in the show, under the auspices of the Defence and Aerospace Industry Exporters Association (SSI) of Turkey as had also been the case for the previous show held in 2012. A total of 17 Turkish firms had participated in the 2012 show; this year, the number more than doubled. In terms of participating countries, Turkey ranked seventh, increasing its ranking by 10 spots compared to the 2012 ranking. Turkish defence firms had the opportunity to exhibit their new products. The MKEK MPT-76 (National Infantry Rifle) produced by the Mechanical and Chemical Industry Corporation (MKEK) of Turkey made its debut. The rifle recently entered into use by the Turkish Armed Forces. Otokar, a Turkish manufacturer of military vehicles and buses, exhibited its Arma 6x6 and 8x8, Cobra II and Ural armoured combat vehicles, as well as its turret systems. For Otokar, this was

the first showing in Europe of the Cobra II vehicle with its desert camouflage pattern, the tactical wheeled armoured vehicle Ural, and its new turret systems. The Başok-762 Remotely Controlled Weapon Station was featured atop the Ural vehicle, the Bozok-MKT 25 and the Mızrak-30 turret systems were mounted on the Arma 6x6 and 8x8 vehicles, respectively, and the Keskin turret system atop the Cobra II vehicle. Turkish missile and rocket producer Roketsan exhibited its cruise missile SOM (Stand-Off Missile), the 70 mm laser-guided missile Cirit, the long-range anti-tank missile Mızrak-U and several types of its rocket technologies.



LH Aviation LH- 10 Aircraft

New Era of Cooperation Planned Between Turkey and France

Prof. İsmail Demir, Undersecretary for Turkish Defence Industries (SSM) and Mr. Latif Aral Aliş, The Chairman of Defence and Aerospace Industry Exporters Association of Turkey, met with companies and took part in committee visits. On the first day of the show, Prof. Demir and his entourage visited the French Ministry of Defence booth and obtained information on the land systems in use by the French army. Prof. Demir also met with Mr. Laurent Collet-Billon, head of the French government's defence procurement agency DGA (Délégué Général de l'Armement - General Directorate for Armement) concerning possible business opportunities between French and Turkish defence industries. Undersecretary Prof. Demir stated to reporters that no specific area of cooperation with France had yet been established, but that both sides were open to instituting a joint military committee in the near future which would further study areas of cooperation between the two countries.



Prof. Demir also stated that the positive environment currently existing with respect to the political relations between the two countries should be capitalized on, and that it would serve well to create a road map.

Following his meeting with the head of DGA, the Undersecretary visited the exhibition booth for the French Safran Group and received information on the company's FLIR, ammunition and border security technologies and military electronics and avionics systems. Undersecretary Prof. Demir then visited the exhibition booths of the French light aircraft firm LH Aviation and the Turkish firm Vestel Defence Industry exhibiting its ground control station; he obtained information regarding the joint venture planned by the two companies. Per the cooperation established between Vestel Defence Industry and LH Aviation, the LH Aviation LH-10 Ellipse pusher configuration aircraft is planned to be transformed into an unmanned version through engineering services to be supplied by Vestel Defence Industry, following feasibility studies. The cooperation is also expected to involve a strategic partnership for the sale, to third countries, of the UAV model planned to be developed.

Undersecretary for Defence Industries Prof. İsmail Demir made visits to the Turkish companies exhibiting at the fair, examined products in detail, obtained information on the capabilities of each company and met with company officials. Undersecretary Prof. Demir also played host to visits by the French Ministry of Defence to the booths of Turkish defence companies exhibiting at the fair.

The next Eurosatory show is planned to take place in Paris during the dates of 13 to 17 June 2016.



Turkish Pavilion



Türkiye'nin endüstriyel gelişiminde bıraktığı "İZ"ler ile farklı önem taşıdığı öngörülen, havacılık-uzay & savunma alanında bugün gerçekleştirilen faaliyetlerin temelinde izleri olan kişi, grup ve kurumları arasında yer alan;

·Türk Savunma Sanayisi'nin öncü girişimcisi, ilk mühimmat ve silah fabrikatörü Şakir Zümre'nin,

·İlk Türk uçağı yapımcısı ve "ICAO 50'nci Yıl Ödülü" ile onurlandırılan Tayyareci Vecihi Hürkuş'un,

·Türkiye Cumhuriyeti'nin ilk Tayyare Mühendisi Selahattin Reşit ALAN'ın teknik bilgisi ve kendi sermayesine dayalı iş ortaklığı girişimi olarak yapılandırılan ilk havacılık sanayi kuruluşunda ulusal kaynaklara dayalı Türk tipi tayyare inşaatı işine giren girişimci Mühürdarzade Mehmet Nuri Demirağ'ın

·Avrupa'nın en gelişmiş havacılık okullarına "kıcılıcı" olarak gönderilerek yetiştirilen ve adeta "volkan" olarak yurda dönen İlk Tayyare Mühendisliği Öğrencileri ve Makinist Stajyerler'in,

·İTÜ uçak mühendisi öğrencilerinin "Yaşayan Efsane" olarak isimlendirdikleri Necmüzzafer Orbay'ın,

·Ülkemizin ilk teknik yükseköğretim kurumu İstanbul Teknik Üniversitesi'nin,

haklarında yapılmış önceki araştırma, tespit ve değerlendirmelerden de yararlanılarak sistematik ilişkili bir akışta incelendiği "Can'Ca Türkiye'de, Endüstrinin Gelişiminde İz Bırakanlar" kitabında bugün dünle değerlendirilmiş ve yarına yönelik dersler çıkarılarak geleceğe yönelik önerilerde bulunulmuştur.

Hazırlanması vefa temeline dayanan kitabın getirisi ile de havacılık yükseköğrenimindeki bir kız lisans öğrencisine başarı bursu yapılandırılarak sonucu ile de vefa vurgusu yapılmaktadır.

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RAF Pilots “Eye View” from the HAWK Jet Trainer Aircraft

Mr. Andy Blythe, BAE Systems Test Pilot (late RAF); Flt Lt Al Luckins, RAF Instructor Pilot; Flt Lt John (Dot) Letton, RAF Instructor Pilot; Sqn Ldr (Rtd) Gareth Roberts, Head of Training, Hawk UK and Mr. Steve Harris, BAE Business Development Executive, Turkey assessed HAWK Jet Trainer Aircraft’s operational capabilities from the perspective of experience pilots.



© BAE Systems

Defence Turkey : BAE Systems has a big presence at ILA Berlin with the RAF's Hawk T2 advanced jet trainer and its Pilots. Could you please inform us about the show and your activities?

Mr. Steve Harris – Business Development Executive, Turkey : BAE Systems is proud to be a part of the ILA Berlin Air Show and especially so this year given the very clear links and emphasis on the Turkish Aviation Industry. Turkey is a country that we are closely aligned with and we have a keen interest in the air-sector opportunities. We had a significant outdoor display this year including our trailer-mounted displays demonstrating the benefits of the Hawk Synthetic Training Systems and Mission Data Replay; plus some systems that underpin our continual drive for improvement. These include integrating the Link 16 system, and two optical devices for pilot use; Striker, a Fast-Jet or Rotary Visor Projected

Helmet Mounted Display and our Q-Sight monocular helmet mounted display.

We were also delighted to be associated with three presentations at the 6th Future Military Pilot Training Conference. Air Commodore Terry Jones MA RAF (UK Director Flying Training) and Wing Commander Dan Beard, (Officer Commanding IV(R) Squadron RAF) briefed on Advanced Jet Training and the subject of “download” while Andy Blythe, (Hawk Test Pilot, BAE Systems) gave his views on pilot training for next-generation aircraft. Finally, Gareth Roberts, (BAE Systems, Head of Training at RAF Valley) presented on the key tenets and requirements for next-generation lead-in-fighter-trainers.

Defence Turkey : I understand you are an instructor at RAF Valley using the Hawk for advanced pilot training. How well does this aircraft fit into the training system and how

is it received by your students?

Fit Lt Al Luckins RAF – Instructor Pilot : The Hawk T2 allows us explore concepts and skill sets that hitherto have been unavailable to the students until the front line aircraft, principally through the use of the on-board synthetic training systems. As a result, the course pushes the students' abilities in disciplines that have a direct read-across to front line training. The data interpretation and management very closely represents the Eurofighter Typhoon's and so provides a realistic test of a student under representative conditions. The tangible link to front line flying is something that students really enjoy, providing a previously unparalleled realism to all the missions flown on the course. The ability to for the students to look back at their missions and replay them step by step in their own time is also very popular, enhancing the learning experience considerably.

Defence Turkey : You presently use the Hawk to train your students for conversion to Eurofighter Typhoon. How will the RAF approach the advanced standard training for F-35?

Fit Lt John (Dot) Letton RAF – Instructor Pilot : The RAF is currently examining how best to train for the F-35 and the leap in capabilities it brings. However, when analysing the training requirements, there isn't as big a gap between our current fighter (EF Typhoon) and the F-35 as may be imagined. The overall skills of data management and tactical situational awareness that the T2 has introduced to the current RAF training system apply well to the F-35. Enhancements in the form of software changes to augment the training value could easily and cheaply be introduced to further align the T2 to the F-35 training need.

Defence Turkey : The Hawk family of aircraft have a long provenance. What is it about the new generation of Hawk that seems to make the customer so happy with the aircraft and training systems? How much reliance is now placed on the use of simulators with this aircraft when training students?

Sqn Ldr (Rtd) Gareth Roberts – Head of Training, Hawk UK : The Hawk is a well-proven and trusted training platform both in terms of capability and flying performance. Enhancing such a platform with



© BAE Systems

HAWK Jet Trainer Aircraft



embedded simulation, modern avionics and navigational and safety systems has now expanded training capability into a completely new and exciting era. This huge jump in capability is already being exploited by several Air Forces to better train and prepare their pilots for the challenges of 4th and 5th generation fighters, by providing skills that are both relevant and transferable.

The complexity and capability of the Hawk's systems, and the information and systems management skills that the trainee pilot now must learn has significantly elevated the importance of simulator training. The simulator, as a training device, must now be regarded as equally important as the aircraft in a modern training system, as skills learned on the ground in the synthetic environment are fundamental to a trainee's development and success in the air.

Defence Turkey : You have been the BAE Systems Hawk test pilot for many years now and will have seen a large number of nations use this platform in their training pipeline. What is it that makes Hawk so accomplished as a training platform? Can you give me idea as to how the Hawk aircraft is to be developed further – what is next for this platform? Hawk is in use with many customers worldwide; are there examples of this system being used via a collaborative approach with another company or nation?

Mr. Andy Blythe – BAE Systems Test Pilot (late RAF) : The Hawk is a very simple plane to fly and operate but it needs considerable ability to maximise its potential therefore it is an excellent tool for developing future fast jet pilots. It can easily emulate 90% of the traditional 4th generation flight envelope for a fraction of their

operating cost. 500Kts at low level is the equivalent to 845ft/sec which is more than enough speed to assess whether a student pilot is going to be suitable for the front line.

There are many developments being considered. Sensor simulation will continue to be developed to ensure the aircraft continues to emulate the current weapons and sensors that operate in frontline fighters. As technology moves on, especially in screen technology, I am sure Hawk will change to large area touch screen displays with embedded processors. Also, as most Air Forces are struggling with budgetary constraints, aircraft are less likely to have just one role and to that end, I am sure work will be done to integrate a targeting Pod and the latest crop of smart weapons on to the Hawk.

BAE Systems has a history of collaboration spanning over 35 years of Hawk projects working very closely with all of our customers either here in the UK or the customers' country. Recent examples include a collaborative approach and technology offset with the South African Air Force for their latest weapons and multi data-link and with our biggest Hawk user, the Indian Air Force and Navy. Indian Industry (Hindustan Aviation Limited) builds the Hawk Mk 127 aircraft under licence and have been closely involved with the recent aircraft upgrades. We have also collaborated with HAL on many projects such as Jaguar and Sea Harrier.

Defence Turkey: What is the current status of BAE Systems activity in the Turkish air-sector?

Mr. Steve Harris : BAE Systems is a forward-looking company and is seeking to build on its relationship with Turkey. We continue to work with the SSM and Turkish air-sector primes to position BAE Systems as a partner or supplier of choice for future air-sector programmes. We have a significant interest in the T-FX programme and look forward to the opportunity to respond to the RFP for the provision of engineering/technical support to the Development Phase of this programme. Equally, we see opportunity to be a part of the TX project/T-38 replacement programme as it matures and with the Hawk platform, have a great product that could be considered as the basis for a collaborative solution, should this be required. In addition, our USA-based business continues to provide support to the Turkish air-sector with the supply of electronic system components and products for the F-16 aircraft while also developing prospects to be a part of the supply chain for Hürkuş. ■



Mr. Steve Harris – Business Development Executive, Turkey



Upgraded “Strela-10M” ADMS: Destroying Targets Accurately

Combat effectiveness of the upgraded “Strela-10” Air Defence Missile System (ADMS) has been enhanced manifold!

The majority of local wars and armed conflicts in the past decades were characterized by the extensive use of air Defence assets. The contribution of the air Defence forces to the victory of any of the sides was, as a rule, not only of tactical but also of strategic importance. A special role was played by the short-range air Defence missile systems. In particular, by the famous

“Strela - 10” ADMS (SA-13 “Gopher” – according to NATO classification), created in the erstwhile Soviet Union and designed to fight against low - flying targets: helicopters, attack aircraft and cruise missiles.

At present the “Strela-10” ADMS is employed for coverage of motorized infantry or tank units and formations both in the battlefield and on the march against enemy’s low-flying air targets. The system is in service with nearly two dozen countries around the world; it has repeatedly taken part in action and repeatedly demonstrated its high combat effectiveness.

More than twenty five years of operating experience in the armed forces have emphasized a number of distinctive features of the “Strela-10” ADMS, which can be for sure



considered as its advantages. First of all, it is high reliability, high combat effectiveness, and ease of operation.

Within the period from 1977 to 1989, the “Strela-10SV” ADMS has been repeatedly upgraded. Today, the State Foreign Trade Unitary Enterprise “Belpetsvneshtekhnika” performs overhauling cum upgrading of the combat vehicle of the “Strela-10M” ADMS to the level of the “Strela-10BM2” ADMS.



The main purpose of the upgrading is to enable round the clock operation of the ADMS and increase its combat capabilities.

Upgrading of the “Strela-10M” ADMS to the level of the

“Strela - 10BM2” ADMS provides for enhancement of its combat employment and improvement of its survivability. The “Strela-10BM2” ADMS enables operation under conditions of low visibility and at night, ensuring air target detection at a distance of not less than 15,000 m. Detection range in the daytime has been increased up to 20,000 m (more than threefold).

The “Strela-10BM2” ADMS is equipped with a four-channel thermal imaging-TV electro-optical station “Strizh-M” (EOS “Strizh-M”). In passive mode, the “Strizh-M” EOS provides searching and detection of air targets such as “tactical fighter”, flying at an altitude of 1,000 m at a distance of up to 20,000 m, and its



subsequent automatic tracking. In addition, the

“Strizh-M” EOS enables determination of boundaries of the SAM launch zone and ensures forced turning of the launcher to the likely point of target materialization to conduct tail-on firing. The “Strizh-M” EOS monitor displays air situation and service information.

Modern navigation and orientation equipment, incorporated into the combat vehicle (CV) reduces CV readiness time by more than sevenfold. The equipment determines location and course of the combat vehicle by the signals from satellite navigation systems GLONASS, GPS, geomagnetic sensor and digital distance sensor, and then the information is displayed on the monitor of the CV commander's automated workstation (AWS-C), which is installed in this combat vehicle for first time.

The AWS-C enables receipt of external target designation data, display of air situation on the electronic map, receipt of information

from the CV's systems to evaluate its serviceability, availability of missile basic load and fuel, transmit information about the CV position, CV technical condition and various reports to the higher command post.

To ensure communication, the combat vehicle is equipped with modern digital radio station R-181-50TU.

The ADMS power supply system and crew life support system have been significantly improved. The modified power supply system includes a remote diesel generator and a rectifying starter charger. The new power supply system enables continuous combat operation during 24 hours. The diesel generator is installed 30m from the combat vehicle, thus reducing thermal visibility of the ADMS by half. The rectifying starter charger is used to start the combat vehicle and recharge the batteries.

Furthermore, the combat vehicle is equipped with an air conditioner, which can operate both on the move from the CV engine, and at halt – from the remote power plant, thus creating favorable conditions for combat crew on duty. There is also an energy-intensive modern air heater installed in the combat vehicle which consumes ten times less power than its predecessor and has a higher reliability.

Old night vision devices, which were used for terrain illumination,



have been replaced by modern night vision goggles that allow the operator to observe terrain at night under natural light; day/night sight DDN-120-6X-D/N is mounted on the 7.62 mm PKMB machine gun.

The “Strela-10BM2” combat vehicle is also fitted out with the equipment for moving across water obstacles.

The “Strela-10BM2” ADMS crews have conducted more than twenty live firing at targets, simulating modern and future air attack weapons and all the launches have been graded as “excellent”.

However, all the above is only a small fraction of what one can tell about the new modern “Strela-10BM2” ADMS, developed by Belarusian specialists.

It may be no coincidence that during the “MILEX-2014” Exhibition of Weapons and Military Equipment held in Minsk, the “Strela-10BM2” ADMS attracted a lot of interest from potential customers.

Performance characteristics	
Detection range, km	
by day	up to 20
by night	up to 15
Automatic tracking range, km	up to 15
Target recognition range, km	7-10
Kill zone boundaries:	
in altitude, km	0.025-3.5
in range, km	0.8-5
Missile basic load, pcs	8
Types of the missile used	9M31M, 9M3, 9M37M, 9M37MD, 9M333
Target kill probability (depending on the SAM type)	0.4-0.6 (0.6-0.9)
Speed of the targets destructed	
head-on, m/s	415
tail-on, m/s	310
Warm-up time of the navigation equipment, s	no more than 180
ADMS continuous combat operation, hours	8
Basic chassis	Multi-purpose light-armored towing vehicle (MPLATV)

Sarsılmaz SAR 223 Assault Rifle

For a long time, Turkey procured the needed light combat weapons from NATO and its allies under military assistance, and as of 1975, from MKE (Mechanical and Chemical Industry) corporation under licensed manufacturing. Today, a significant amount of sources are transferred abroad as the light weapon needs are satisfied by outsourcing from abroad or under licensed manufacturing.

Currently, as private sector companies have improved their capabilities and are realizing authentic models in areas like weapon manufacturing which require advanced technology, it is considered that benefiting from both the company and country capabilities in light weapon production is of significant importance. It is a must to keep the sources at home, to perfectly meet the needs of Turkish security forces, to acquire the ability to design and manufacture authentic weapons aimed for the domestic defence industry, and to bring competitiveness to improve product development abilities, as well as to ensure possibilities for exporting abroad.

In order to reach this aim, Sarsılmaz began to develop a project completely based on its own resources, having an authentic design, featuring characteristics that will meet the needs of worldwide markets, and aimed to be sold in worldwide markets. SAR 223 assault rifle has emerged as a national and authentic design as a result of this Research & Development project.

At the outset of the project, a gas-operated rifle with high export potential was the initial design based on customer demands. Meanwhile, scientific institutions and universities planned various scientific endeavors, meeting specific scientific factors identified in the developed R&D project to ensure an authentic design. The developed R&D project was approved by TÜBİTAK-TEYDEB (The Scientific and Technological Research Council of Turkey – Technology and Innovation Grant Programs Directorate) Scientific Board in May 2009, and was successfully completed under the name: “Project on Developing a Light Effective, Modular, Modern Assault Rifle with High Competitive Power in International Market” in 2 years under TÜBİTAK (Scientific and Technological Research Council of Turkey) support. The cost of the project was US\$ 2.340.000. In this project, there was cooperation among scientific institutions such as Middle East Technical University, Kocaeli University and TÜBİTAK SAGE.



Basic elements of the design concept:

In line with technological developments, the improvements in weapons, tools and equipment, have had a direct impact on the battle field. It has become of significant importance to ensure that each soldier carrying an assault rifle strikes the target at the first shot in battle conditions, day and night, under any land and weather conditions, especially in residential areas.

For this purpose, the key criteria taken as a basis for the development of the SAR 223 assault rifle were as follows:

- › High firing capacity,
- › Featuring modular weapon characteristics,
- › Light,
- › Featuring high effective range,
- › Effective weapon structure with high healthy shooting capacity under night and poor vision conditions.

Designated features of SAR 223 assault rifle: It has a structure effective under any land conditions, any climate conditions, day and night, light and modular with high hit percentage at first shot, featuring grenade launcher, using improved ammunition, integrable with improvable electro-optical systems and accessories for improving the effectiveness of the weapon such as automatic distance measuring day/night optical vision scopes, laser pointer, automatic shooting control system.

Effective and successful use of the warrior soldier's basic weapon, that is the assault rifle, depends on the training level of the user. Therefore, a simple-to-use weapon system design will reduce the necessary training time.

Moreover, domestically performed manufacturing will ensure that maintenance, repair and procurement of spare parts are more cost-effective, quicker and simpler. Therefore, it must absolutely be taken into account that the system to be procured should:

- › ensure easy training, use and maintenance,
- › be compatible with other equipments of the user,
- › be compatible with materials and equipments used in NATO countries.

Design and Project stages: This weapon, prepared for heavy military duties, incorporates modern advanced engineering software and techniques including many new technologies developed during the time period up to its production. In the design stage of the rifle, which is the authentic design

of Sarsılmaz, first the drawings of the rifle were drafted and then a virtual prototype was prepared on a computer. Fatigue, break, vibration, friction, finite element analysis were performed by subjecting the operating system to electronically calculated actual forces. Thousands of virtual bullets were fired using the virtual prototype in a virtual platform where real bursting conditions were simulated.

In the end of this stage, the first phase of the design was completed by creating a final form before the prototype under the optimization study which ensured application of the most suitable technical form.

As permission of the Ministry of National Defence is required for building prototypes and fire tests, completion of bureaucratic procedures were followed, and upon grant of the prototype permission in the first half of 2012, 2 test prototypes were prepared, and the initial fire tests were successfully completed. Upon inspection and assessment of the committee from the Ministry of National Defence, the manufacturing line was qualified, and on December 31, 2012, Sarsılmaz became the first private sector company in Turkey to be granted an assault rifle production permit by the Ministry of National Defence. This first step forward will help Sarsılmaz cover great distances toward developing a weapon family in the near future, and promoting a high competitiveness in the international arena.

“With This Project, Sarsılmaz has well Deservedly Gained itself a Place Among Major League Players in Light Weapon Manufacturing”

SAR 223 is a version that combines the most current modular weapon concepts. It features a folding stock developed to reduce the carriage length along with Picatinny rails integrated to the body enabling the user to mount many accessories from laser pointer to flash lights from folding sights to day/night vision devices; and as an assault rifle, it can also be equipped with miscellaneous battle accessories including a 40 mm grenade launcher. SAR 223 reflects the masterful combination of traditional technologies in terms of design.

Aselsan and TAI Continue to Rise at World's Top 100 Greatest Defence Industry Institutions List

Aselsan and TAI companies from Turkey managed to enter the "Defence News Top 100" List based on previous year's defence sales and issued by USA's weekly "Defence News Magazine" and recognized as the world's most prestigious defence industry list. Both companies managed to sustain their consistent growth also in this year. Aselsan was ranked as

the 67th company this year where it was 74th on the list last year while TAI climbed 5 steps and moved from 85th to 80th place.

Aselsan's defence sales of 2013 increased to 1.001,4 billion USD with 16.1% increase while TAI's defence sales came up as 788.4 million USD with an increase of 13,70%. Considering the data of the previous year, Aselsan's

defence turnover was 862.4 million USD in 2012 and TAI reached the level of 693.4 million USD. Aselsan gains 97,1% of its sales from defence industry activities and 86,4% of TAI's sales is composed of defence industry activities.

The world's most significant defence industry companies exist in the list to which TAI and Aselsan entered from Turkey.

TAI Signed A Contract During FIAS 2014

Turkish Aerospace Industries, Inc. (TAI), ranking among the top hundred global players in aerospace and Defence arena, signed a contract for the development, qualification and supply of ejection seats for TAI's New Generation Hürkuş-B Basic Trainer Aircraft with Martin Baker Aircraft Co.Ltd., the world's leading manufacturer and supplier of ejection

seats. The contract is initially for 15 aircraft with an option for a further 40 aircraft. This contract marks another phase in growing relationship between TAI and Martin Baker which was started in 2008 with Hürkuş Program and continued with T-38 Modernization Program. Two companies hope this contract will lead to further cooperation on other future programs.



New Participation to Researcher/ Postgraduate Training Program for Defence Industry (SAYP)

One more university joined the SAYP Program initiated in 2011 with the attendance of Undersecretary for Defence Industries Prof. İsmail Demir. A memorandum of understanding was signed by the Undersecretariat for Defence Industries, Roketsan and Abdullah Gül University and thus an important step towards encouraging the cooperation between industry and universities for meeting the researcher and qualified personnel requirements of the defence sector has been taken.

Researcher/Postgraduate Training Program for Industry (SAYP) was launched in order to restructure the ongoing or completed postgraduate

thesis studies of the students registered to postgraduate programs in universities ("Researchers") while being employed by defence industry companies in line with companies' medium and long term research and development studies and convert these studies into guided projects to be implemented in the priority areas determined by Undersecretariat for Defence Industries. A total of 18 projects covered in 13 contracts have been launched within the scope of SAYP as of June 2014.

The very first SAYP Memorandum of Understanding covering the existing and future postgraduate

students of Middle East Technical University while working at defence companies was signed on October 4, 2014 by the Undersecretariat for Defence Industries, Middle East Technical University (METU), Aselsan, Havelsan and TAI. Memorandums of Understanding in order to expand the scope of SAYP were signed between Undersecretariat for Defence Industries and METU, FNSS, Havelsan and MiISOFT on November 25, 2013 and also between Undersecretariat for Defence Industries and Gazi University, Roketsan and TAI on February 20, 2014.



ICterra Aims to Expand its Presence in Turkey Thanks to its Expertise in Global Markets

Mr. H. Vedat Uslu Founder & CEO of ICterra enlighten us about history ICterra, carrying out programs with Turkish defence industry, its export activities and studies of cyber warfare and security for Defence Turkey magazine.

Defence Turkey: First of all, could you please inform us about the history of ICTerra, its products and capabilities focused on defence and security?

ICTerra was established as a software R&D team within Siemens Turkey (then known as Simko A.Ş.) in Ankara, back in 1991. Over the past 20+ years, our team has developed deep know-how in different areas encompassing the ICT sector and completed numerous projects successfully, locally and globally. In 2000, ICTerra became one of the global R&D centers of Siemens. In 2007, our R&D team was commercialized as Siemens Enterprise Communications (Siemens EC A.Ş.). In March 2013, Siemens EC became a 100% local firm as a result of a MBO – known as ICTerra, which implies “the world of information and communication technologies.” Today, with our 100 employees, based in our 1400 m2 office space located in METU Technology Park, we continue to provide services for the defence and telecommunication sectors.

ICTerra is an ICT services and consulting firm. We have deep competence in information and communication technologies, which we continuously strive to improve by creating an open and transparent work environment, by encouraging and investing in innovative ideas and by closely following trends and what's being demanded in our respective sectors.

Primarily, we offer software research and development services to the defence sector. With our expertise in multi-national projects, PMP certified project managers, ISTQB certified test engineers, and experts on Java, .NET and embedded programming technologies, we are capable of building all kinds of high-end software solutions and products. Our teams are competent in handling large-scale projects and are equipped with agile project management experience.

Quality assurance is also one of our main service areas. Today, software test is seen as a complex engineering form -- test is not only seen as an integral part of software projects, but also as a project on its own. At ICTerra, we follow TMMI (Test Maturity Model Integrated) guidelines and a KPI-driven approach to ensure

service excellence. Test automation is another important aspect of quality assurance. Its purpose is not only to increase quality but also to decrease costs. Our test team is capable of carrying out test automation projects using tools such as IBM Rational Functional Tester, SmartBear Test Complete, HP Quick Test Professional, and Selenium IDE etc. ICTerra is a one-stop software test center that can address all aspects of quality assurance, while meeting global standards.

Over the past 23-years in the ICT sector, we have been implementing security concepts in our R&D projects primarily around secure VoIP communications. Furthermore, we developed know-how around IT security processes such as ISO 27001 and risk assessment.

Under the umbrella of IT security, one of our primary areas of expertise is cyber security. The number of companies who depend on the Internet to provide their services is increasing rapidly. Ensuring the competitiveness of these companies depends mostly on the reliability of their services. The security vulnerabilities found in ICT systems, can cause service failures and reveal trade secrets resulting in significant financial loss for companies. According to McAfee's report, The Economic Impact of Cybercrime and Cyber Espionage (June, 2013), the total cost of cyber-attacks incurred by countries and companies was in the range of \$300 billion and \$1 trillion (0.4%-1.4% of global GDP) in 2013.

Likewise, in Turkey, ICT technologies are increasingly used by SMEs and large-scale enterprises. As these enterprises work towards increasing service quality and speed, they open themselves and their users up to cyber-attacks. According to Arbor Networks' research, in Q2 2014, cyber-attacks decreased by 68% globally, whereas in the same period cyber-attacks increased by 6% in Turkey.

Currently, our experts on IT security are developing a set of cyber security products, which will be able to prevent and categorize attacks. Our goal is to release our product suite to the market in 2015.

Defence Turkey: What are the programs that you are carrying out with Turkish Defence



industry companies and Turkish authorities?

Our relationship with the Turkish defence industry dates back to mid 90's. We have been heavily involved in the Turkish Armed Forces Integrated Communication System (TAFICS) project. In the context of this project, we have developed various administrative applications for MUBILDESKOM such as personnel, training, inventory and logistics management applications.

Our activities in the defence sector have gained momentum in the second half of 2013. We started to increase awareness around our services and competencies in the sector. Initial feedback we received from the Undersecretariat for Defence Industries and other big players in the defence sector have significantly motivated us to expand the scope of our activities. We have placed our applications for the Facility Security Clearance Certificate, both for National Secret and NATO Secret security classifications. Furthermore, we have initiated the process of certifying our



capabilities and corporate processes -- besides the ISO 9001:2008 certificate, which we have already received, we have applied for the ISO 27001, ISO 14001 and CMMI Level 3 certificates.

In the meantime, we have started to work with leading companies in the defence sector. Since June 2013 we have been active in the NATO AIRC2IS project as a subcontractor of ATOS, providing quality assurance services. We are looking into increasing our contribution to the project in system administration and development. Also, we work in collaboration with SDT on satellite programs, developing and executing test strategies.

Recently, we have signed a contract with Aselsan to develop a test simulator, which is a good starting point for our business relationship – and we are in the process of discussing other potential projects we can get involved in. We firmly believe that our competencies in communication technologies, software R&D and test will create grounds for further cooperation.

ICterra's goal is to partner with the big players in the defence sector in Turkey and abroad, improve our capabilities and support their projects by providing quality services – and create value together.

Defence Turkey: It is known that ICterra has a sound success in export. Could you please inform us about your export activities?

ICterra's strategy is to continuously explore different markets and evaluate their unlocked potential in order to stay on top of trends, create opportunities for growth and to stay competitive.

Today, we provide software R&D services for next generation VoIP communication systems to Unify Germany (former Siemens Enterprise Communications). We are actively

involved in the whole lifecycle of the product development process including key roles such as project and product management. Moreover, ICterra owns the second largest communication test lab within Unify, where we carry out complex quality assurance activities.

Currently, we have excellent business ties with global companies, mainly in Germany, and we are competing against Hungary, Romania, Czech Republic, Bulgaria and even against India, in the ICT sector. In a recent bidding of Unify, we won a bid against the world's largest IT company TCS. We will continue to actively look for opportunities in the global market.

Our export strategy is not only to provide R&D services, but also software products powered by ICterra, globally. We are currently working on the development of innovative products in next generation corporate communications and cyber security, which will be launched in 2015.

For the past two years, ICterra has been ranked amongst the leaders (8th in 2013) in the "Software Export" category according to the Top 500 IT Companies Research, Turkey conducted by Interpro Medya. Our goal is to become a leader in software export in the upcoming years.

Defence Turkey: What is your approach to Cyber Warfare and Security? Could you please inform us about your studies in this field?

The key to success at cyber warfare is not different than conventional warfare: "you have to know your enemy." Unfortunately, as opposed to conventional warfare, at cyber warfare, your enemy can "literally" move in the speed of light and traces are hard to follow.

ICterra's approach to solve this problem is not to rely on IP addresses to identify attackers but to consider their behavior and tokens instead. The security products we are currently developing are built on recognition mechanisms, which can differentiate and pinpoint different cyberspace actors reliably even when attack resources and machines get hidden behind different networks.

Once we reach excellence in this approach we will overcome the disadvantage of fighting with shadows, which will be a breakthrough in cyber defence techniques.

Defence Turkey: Would you like to add a message for our readers?

The demand for R&D services in Turkey and abroad is increasing gradually. Seeing this potential, we would like to become an active player in the industry by developing long-term partnerships and providing quality services.

Also, I would like to thank you for your interest in ICterra. I think Defence Turkey is a valuable resource for players in the sector -- highlighting trends, upcoming projects and plans. ■



Mrs. Şebnem Akalın, International Relations met with Mr. H. Vedat Uslu, Founder & CEO of ICterra

TAI Starts Deliveries of Bombardier C Series FTE Units

At a ceremony held on 19 August 2014 at its facilities in Ankara, Turkey, TAI (Turkish Aerospace Industries) delivered to Bombardier the first of the FTE (Fixed Trailing Edge) structures it has assembled for the Bombardier C Series aircraft.

The Bombardier C Series is known for such features as fuel-efficient engines and extremely quiet operation; the first FTE structure completed by TAI will be integrated into wings by Bombardier Aerospace Belfast in Ireland and dispatched to the final

assembly line in Montreal, Canada.

In attendance at the ceremony at TAI's facilities in Kazan, Ankara were, from Bombardier Aerospace Belfast, VP & General Manager of BA-Belfast Mr. Michael Ryan and Vice President of Supply Chain & Fabrications Mr. Stephen Cowan, from TAI, President & CEO Mr. Muharrem Dörtkaşlı, Senior Executive Vice President of Strategy and Corporate Governance Mr. Bekir Ata Yılmaz and Executive VP of Aero Structure Mr. Naki Polat, as well as several members of senior



management.

Upon commencement of mass production, a total of 10 FTE units per month are planned to be delivered by TAI to the wing assembly line in Belfast, Ireland.

MBDA's Brimstone Missile Demonstrates its Maritime Capability

MBDA has successfully demonstrated its Dual Mode Brimstone missile against fast moving and manoeuvring Fast Inshore Attack Craft even in a cluttered environment with multiple neutral vessels in very close proximity.

Conducted in March and April 2014 at the QinetiQ managed Aberporth range in west Wales, UK, an RAF Tornado GR4 aircraft fired two Dual Mode BRIMSTONE missiles (one telemetry and one operational), each fitted with MBDA's latest Anti-FIAC software upgrades, at remotely controlled, 40ft

ASV C13 Fast Inshore Attack Craft targets powered by twin 350hp engines.

The telemetry missile achieved a direct hit on the FIAC's engines with the target operating at its maximum achievable speed in 'low sea state 4' conditions. The operational missile achieved a direct hit at the rear of the second FIAC's cabin, destroying and sinking the target which was operating at maximum achievable speeds in 'sea state 3' conditions. Missile impact occurred whilst the target was within very close proximity to three neutral vessels. The target was destroyed and

sunk with the single shot and with no collateral damage to the neutral vessels.

These tests confirmed Dual Mode Brimstone's first pass precision and lethality against challenging targets in stressing environments. The dual mode Semi-Active Laser and active MMW (millimetric wave) radar seeker works in tandem to provide a unique ability to selectively engage a specific target irrespective of target speed or manoeuvre even when in cluttered, congested and high collateral risk environments.

CTECH Received CMMI LEVEL 3 Certification

CTECH, considered among the leading companies to carry out significant Defence and Information Technologies projects, accomplished one of its goals by receiving CMMI- Dev V 1.3 (Capability Maturity Model Integration) Level 3 Certification which is known as software sector's international certificate of quality.

CTECH started operating in 2005 and has considered process improvement studies as an indispensable part of its activities ever since. With this aforementioned certification, CTECH proved in the international arena that its projects and product development studies are controllable, measurable, foreseeable and repeatable.

Regarding this success, CTECH General Manager Dr. Cüneyd Firat

mentioned that the studies regarding CMMI Level 3 Certification were launched a short while ago and completed successfully in July 2014 through the SCAMPI A appraisal, thus the company was awarded with the CMMI Level 3 Maturity Level Certification. Firat added that as a reference model the CMMI Model contributed greatly to the process of answering the demands and expectations of the customer while

supporting companies taking part in both national and international projects. Firat also pointed out that effective project management and technological infrastructure, strong communication, the importance company attached to personnel's training and development as well as executive's improvement and focus on continuous progress should be considered among CTECH's strengths.

Aselsan Middle East Scores Notable Sale

Aselsan Middle East, a subsidiary of Aselsan Turkey located in Jordan, has executed a notable sale. The company has signed a deal to provide latest technology thermal imaging systems worth 2.15 M USD to the armed forces of an undisclosed country located in the MENA (Middle East and North Africa) region.

Aselsan Middle East operates out of its high-tech plant located in the King Abdullah Design and Development Bureau (KADDB) Industrial Park located in Amman, Jordan; production is performed by Jordanian engineers and technicians using technology and know-how transferred from Turkey.

Aselsan Middle East Psc. Ltd.

(AME), founded two years ago as a partnership of Aselsan Turkey and the KADDB Investment Group (KIG), has already produced highly competent products featuring night vision and thermal imaging technology. Since its inception, the company has executed sales of 23 M USD to the Jordanian Armed Forces of night vision and thermal imaging systems products.

AME also provides post-sales support for the range of products it sells.

Having established itself as a trusted vendor with the Jordanian Armed Forces thanks to the highly reliable systems it produces, AME is now seeking to do the same by targeting the armed forces of other countries in the region.

Roketsan Wins Raytheon's "Supplier Excellence Award" for the 4th Time

Roketsan was granted with "Supplier Excellence Award" for the fourth time at the ceremony held in Boston, USA. The award was received by Roketsan's Vice President Mr. Hayri Torun.

Suppliers are evaluated on timely delivery, performance and process/quality improvement factors for this award and each year the award is granted to the supplier with the

highest rate of success by Raytheon Integrated Defence Systems. Roketsan is currently the one and only certified supplier for "Patriot GEM-T Air Defence Missile Control

Unit Manufacturing" and "Raytheon Preferential Patriot Supplier" in the world. Roketsan is considered worthy of this award for consecutive four years.

Mızrak-U Hit the Nail

Mızrak-U missile within the scope of Turkish Armed Forces' Long-Range Anti-Tank Missile procurement program and that is currently going through testing procedures is expected to be manufactured serially following the completion of its qualification in 2015.

The Long-Range Anti-Tank Missile "Mızrak-U" was designed by Roketsan through domestic capabilities and passed the tests successfully. First test of the missile took place in Karapınar, Konya in February 2014. First firing test of the missile from a helicopter with infrared seeker was fully successful. One of the essential characteristics of Mızrak-U is its Fire and Forget and Fire and Update mode (lock on before/after launch) was tested and achievement was gained.

Mızrak-U Long-Range Anti-Tank Missile Project was launched in order to meet Turkish Armed Forces' demand for long-range anti-tank-missiles through national capabilities. Development studies of Mızrak-U were commenced in September 2008 and

the missile is expected to become one of the principal weapons of T129 Attack Helicopter.

Unrivalled Missile in its own Class in the World

Mızrak-U is a missile system that bears a variety of features outclassing competing anti-tank missiles while being effective against main battle tanks and was developed to be used in helicopters. The missile has two types of warheads. Imaging Infrared (IIR) and Laser Seekers. The infrared image seeker transmits the image to the launcher via the RF data-link and the image is then transmitted to the user's monitor. As the missile's usage concept is based on sensitive guide-

control system, the user is furnished with features such as the day-night and all weather operational capability, fire-and-forget & fire-and-update operation modes, target updates and accurate target aim adjustment capability. The missile is effective against tank armors, concrete protections owing to its high-performance tandem warhead. Laser war headed Mızrak-U is a semi-active laser guided missile system with a lock on before or after launch capacity.

The missile could be fired from attack helicopters or land vehicles day/night and depending on the type of selected warhead, it could be used against main battle tanks, armored personnel carriers, trucks, land vehicles, blockhouses, trenches, buildings and hovering helicopters.

Otonom Teknoloji's Doruk Aerostat System Makes First Flight

In its first flight conducted on 16 July 2014, the Otonom Teknoloji's Doruk Aerostat System successfully completed tests for operational altitude, payload, the tethering system, the mooring station and the ground control station.

The aerostat vehicle body has been designed by Otonom Teknoloji and constructed through indigenous capabilities and materials. The useful load for the two-hour test was an electro-optical camera; video and image transmission was implemented using 802.11n based wireless access devices. The mooring station used was also designed and set up by Otonom Teknoloji. The testing was carried out in two stages, over altitudes 65 meters and 155 meters above ground level. Video and images acquired at various altitude levels were transmitted wirelessly to the ground station.

A total of nine personnel participated in the testing of the system, which included pre-flight transportation and assembly, operational flight and post-flight activities. The Doruk Aerostat System prototype vehicle is 10 meters in length and has a 12 kg useful load capacity. Although being a first-prototype, the system exceeded expectations; a useful load capacity of up to 20 kg has been identified for real-flight conditions subject to varying wind speeds. Based on the test results, the Doruk Aerostat System is expected to perform long-term endurance missions while carrying a variety of useful loads such as thermal imaging cameras as well as radar and LIDAR devices. The



Doruk Aerostat System

system is well-suited for operations involving remote sensing technologies, such as security-related observational activities and early detection of environmental incidents (including early detection of forest fires and search and rescue activities), precision agriculture,

at an altitude of 300 meters, it provides an observational range of 40 km. The D1000 model, whose development will commence in 2015, is planned to carry useful loads of up to 100 kg and operate at an altitude of 1,000 meters, offering an observational range of 70 km.



airborne early warning, TV and radio broadcasts, road traffic management and naval traffic control, critical facility security, mobile communications, and expansion of communications during disaster and emergencies. The Doruk Aerostat System can implement these tasks in a cost-effective manner.

Development is on-going for the Doruk Aerostat System, which is identified as a tethered unmanned aerial vehicle. Two models, named D300 and D1000, are planned to operate at altitudes of 300 meters and 1,000 meters, respectively. The system uses a winch which raises and lowers the aerostat, and the lighter-than-air vehicle can operate at weeks on end. The D300 model, whose design has been completed, can carry up to 15 kg of useful load. Tethered to the ground

Flight of Solar-Powered Aerial Vehicle TepeGöz-S Targeted for Q4 2014

Another project on which Otonom Teknoloji is fast at work is the TepeGöz, a solar-powered unmanned aerial vehicle with capability for vertical takeoff and landing, autonomous navigation, and an operational altitude of 3,000 meters. The first flight for the TepeGöz, still under development, is targeted for the fourth quarter of 2014.

Otonom Teknoloji started its R&D activities in May 2013. Current outstanding projects include MiniSteer, an electronic control unit for use in UAVs and unmanned ground systems that complies with JAUS (Joint Architecture for Unmanned Systems) standards, and ground control station systems.

Otonom Teknoloji is located at Teknokent, the Middle East Technical University's research park in Ankara, Turkey, where its R&D activities take place. Production and testing for all systems and sub-system components for the aerostat system and unmanned aerial vehicles are carried out at the İvedik industrial park in Ankara.

ARGELA's Autonomous Mobile Network (AMON) System: A Wireless Broadband Tactical Network

ARGELA, utilizing commercially available telecomm technologies, establishes mobile broadband communication in the areas with limited or no communications infrastructure and without any telecom operator intervention required.

Through an all-IP military communication network, ARGELA is ready to fill an important gap in the tactical edge with its robust, secure, broad band AMON system in many different platforms.

Exploiting the modern commercial telecommunication capabilities, ARGELA offers AMON, "a high-speed cellular network" so that photos, video and mission critical information can be exchanged via "operator independent" tactical broadband cellular networks.

Tests, performed in different scenarios, proved that troops can set up "deployable" 3G broadband networks in a temporary shelter or aboard a military vehicle, whether it is a small boat or a truck, very quickly and establish the broadband connectivity in local area with their standard (ruggedized) 3G smartphones.

In the era of asymmetric warfare, timely and complete exchange of critical information in the battlefield such as video, voice, data and situational awareness among numerous mobile units, soldiers, commanders, warfighters, ships, is a key issue. Exchange with higher speed, lower latency is the difference between success and failure, sometime between life and death. On the other hand, commanders have to communicate effectively to coordinate their resources or collaborate with coalition partners, non-government organizations, and humanitarian assistance/disaster relief partners. Modern communication infrastructure is a must to ensure such a capability.

ARGELA Autonomous Mobile Network (AMON) system provides a broadband local wireless IP network infrastructure that is mobile, quickly deployable, and easily mountable, by utilizing 3G technologies without any support from or connection to telecom operators. Towards an all IP, flat architecture, utilizing standards-based technology, AMON also provides cost effective, high available and interoperable systems.

AMON provides 3G coverage and this coverage, depending on the

operational requirements, can be easily extended via backhaul systems such as WIMAX/SATCOM or ADSL connections.



The underlying capability of AMON, is the ARGELA's 3 year-long active in-house R&D investment in Smallcell products. ARGELA has now, Smallcell products in the market available for both indoor and outdoor purposes.

AMON— Deployable 3G Network with no Telecom Operator Intervention

- > Mobile broadband communications for up to 16 active users,

- > Utilizes 3G technology
- > Support All IP comms
- > Provides a stand-alone solution but also capable of interfacing with commercial or private networks
- > Range extension via backhauls – WIMAX, SATCOM or ADSL
- > Easy to use, setup, configure and monitor
- > Quickly deployable
- > Suitable for manpack

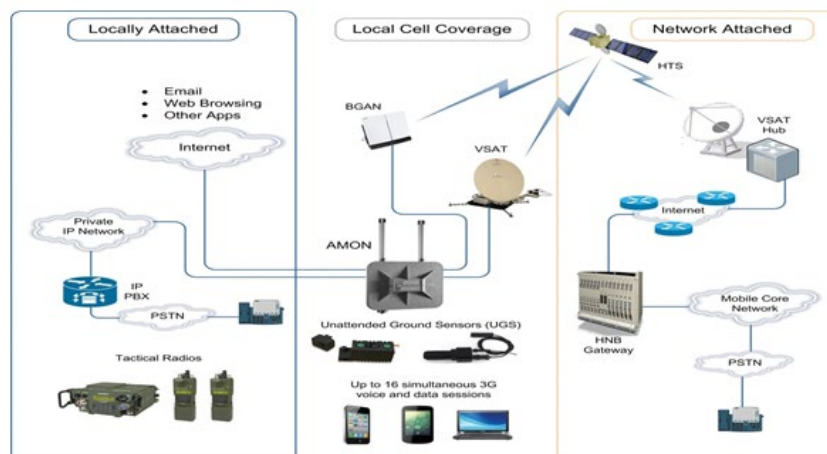
AMON supports two different operational modes. In local mode it can be utilized as a stand-alone, operator independent 3G service provider. Up to 16 active users can be connected to the system.

The diagram below shows the network connectivity options for a single AMON unit. (SATCOM connection can be replaced with WIMAX or ADSL backhauls)

In Network Mode AMON can be utilized to connect military personnel with each other and their command using handheld devices that can provide a wide variety of applications.

With these capabilities AMON can be utilized for different tactical/operational purposes in various platforms.

Military Sites:





- › Private Cellular Network with no MACRO Coverage
- › Last 2 km's of communication
- › Surveillance, intelligence gathering via fixed or
- › mobile platforms like UAVs.

Border Sites:

- › Detection Nodes of Cellular Phones
- › Silencing Selected Phones
- › Border/Homeland security
- › On-Demand Deployable Cellular Sites for Military and Public Safety
- › Special Operation Forces
- › Platform-to-Platform (ex: ship-to-ship)

On board the platform(ex: ship, aircraft, command base)

- › Disaster Recovery
- › Emergency Services

Amon:

- › Low weight
- › Small Size
- › Low power draw
- › Quick setup <5mins
- › Can be deployed in many different platforms

Although cybersecurity is one major concern that has hindered adoption of commercial systems (like smartphones) as the main capability for military communication systems; with increasing emphasis on asynchronous threats and disaster-recovery and emergency services, broadband 3G services nicely forms an effective alternative communication capability.



In this context, ARGELA offers a possibility to integrate Hardware or Software crypto capabilities in addition to existing standard 3G security measures.

Amon Technical

Radio frequency	3G/UMTS FDD band 1
Radio output power / Receiver Sensitivity	32 dBm (3.6 W) maximum / -115 dBm
Access Control	Closed or Open
Interference and Radio Management	Self Organizing Network (SON) Algorithm
Max number of subscribers taking service simultaneously	16
Max number of idle subscribers attached simultaneously	64 users for closed mode, unlimited for open mode
Cell Radius	2 km maximum, support for 120 km/h user mobility
3GPP Standard compliance	3GPP Release 8.2 compliant
3GPP UMTS FDD Release-6 compliant	3GPP Release 8.2 compliant
UMTS/3G Services	Audio (12.2 kbps) and video calls (64 kbps) PS data services up to 384 kbps HSDPA 14.4 Mbps (Restricted by cable internet speed) HSUPA 5.76 Mbps (Restricted by wireless internet speed) Data Throughput: 4-5 Mbps (Downlink) 1.5 Mbps (Uplink – Mobile to Backhaul)
Security	All data exchange between the device and central systems are executed over IPsec tunnel connection in a highly secure and with password.
Backhaul Features	1 x 10/100 Ethernet
Physical and Electrical specs.	Size: 269 mm x 239 mm x 72 mm Approximate weight: 3,5 kg Broadband connection interface: 1 RJ-45 10/100 Ethernet Max. power during operation: 45 Watt max
Environmental Ranges	Operation temperature range: From -20°C to 55°C Storage temperature range: From -20°C to 70 °C Operating relative humidity range: Between 10% and 95% Storage relative humidity range: Between 5% and 95%
Compliance Standards	Health standard : ETSI EN 50 385 : 2002 ETSI EN 50 383 : 2002 Electricity safety standard: ETSI EN 60 950-1 2006 ETSI EN 60 950-22 Electromagnetic compliance standards: ETSI EN 301 489-23 ETSI EN 301 489-1 Radio spectrum standards: ETSI EN 301 908-3 ETSI EN 301 908-1 Water proofness (IP67) : IEC/EN 60 529

Specifications About Argela

Argela helps telecom operators to increase their customer satisfaction and revenue while decreasing their operating costs and churn through its agile approach and innovative products.

Argela's solutions portfolio includes Small Cell Solutions for public and Defence (3G & LTE), Network Performance Monitoring, Software Defined Networks, Internet TV, Fixed-Mobile Convergence and Regulatory solutions.

Collaborating with 14 Universities around the world, Argela has 13 US Patent applications and 8 projects funded by European Union.

Argela is a leading provider of Small

Cell Solutions and has been named as a "Cool Vendor" by Gartner for its Small Cell Technology. Argela is a member of GSMA and Small Cell Forum and works closely with the other players of the ecosystem; network operators and other solution providers. As an active member of the Small Cell Forum, Argela contributes to addressing the key issues and challenges of the small cell market.

Argela Internet TV has been recognized by the industry with IPTV Industry Awards, "Best IP TV, Hybrid or Connected TV Service Growth Achievement Award".

The company is headquartered in Istanbul, Turkey and has offices in Ankara, Turkey and Silicon Valley (Sunnyvale, CA, USA).



İşbir; Turkey's Leader in Alternator and Generator Production

İşbir Electric Industry CO. was founded in Balıkesir in 1977 with the partnership of workmen working at foreign countries. İşbir Electric Industry CO, the name of which was inspired from Workmen's Association in those days, initiated the production of indigenous alternator with Hitzinger license in 1981 and has been continuing its production under İşbir brand since 1984. İşbir Electric Industry CO. has been continuing its production at its factory having 12.000 m² indoor, 20.000 m² outdoor space and with competent engineers, technicians and qualified personnel and Turkish Armed Forces owns 99,86% of its capital as of today.

Serving as a school in Turkey in the production of generator, İşbir Electric Industry CO. also stands out as the single producer that produces its own generator and has alternator test laboratory in Turkey.

It is decent to say that İşbir Electric Industry CO. has served as a school for the training of many qualified human resources already employed within the sector owing to its technological know-how on alternator and panel production extending to years. Synchronic and dual panels as well as marine type alternators, mobile systems and related technology and infrastructure produced by İşbir Electric Industry

CO. have always served as a model to other companies in various projects.

Broad activity field

The design, development, production, test and qualification activities regarding alternator, generator, converter, generator set and panel within the field of electrical and electromechanical equipment production technologies have become prominent as main interest areas.

Modernization activities to speed up in the forthcoming period

İşbir Electric Industry CO, which has focused on design, development, production, test and

qualification activities regarding alternator, generator, converter, generator set and panel, aims to speed up modernization activities in the forthcoming period. Within this scope, it is aimed to produce diversified alternators with minimum margin of error, high efficiency and responsive to all kinds of market needs.

İşbir Electric Industry CO, which has a corner on the market in terms of alternator and generator production in Turkey with its high quality production, effective and continuous sales, prompt aftersales support, cost effective and competitive advantage, also aims to be a pioneer in Turkey in the future with its projects delivered both in Turkey and foreign countries as well as its R&D studies.



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MTU Farnborough Airshow Results: Orders Worth 1.3 Billion Euros

For MTU Aero Engines, this year's Farnborough International Airshow was a big success: Germany's leading engine manufacturer has announced around 1.3 billion Euros in orders, with new business being at the same level as at the last Farnborough Air show. "This high total order value shows once again that the new programs in which we took stakes hold great prospects for the future," says MTU CEO Reiner Winkler. "Today, airlines are always looking for engines that meet ever more stringent standards in terms of fuel efficiency and noise emissions; we score high on both counts with engines for the regional jet, narrow body and wide body segments alike," Winkler goes on to explain. The overall volume of contracts for engines in which MTU has workshares is made up of a balanced mix of propulsion systems for short- to-medium-haul and long-haul airliners.

Full speed ahead for the new wide

body generation: The largest share of new orders came from the GE9X for the Boeing 777X, in which MTU has recently announced its stake. Emirates and Qatar Airways from the Gulf region are the biggest customers, who placed firm orders for GE9X engines to equip 200 Boeing aircraft and took out options for 100 more GE9X-powered jets. MTU also profits from orders for Boeing 787s: Lessor ALC has selected the GEnx engine to power 30 Dreamliners.

A similarly high volume of orders was received for the geared turbofan (GTF) engines. The largest GTF order was received from Mexican carrier VivaAerobus, and another deal was signed with Philippine Airlines, with a total order tally of 50 aircraft with PurePower® PW1100G engines for the carriers' A320neo fleets. The PW1500G, which is the GTF variant to power Bombardier's CSeries, also scored big. The Canadian aircraft

manufacturer racked up firm orders and inked letters of intent for a total of 67 aircraft from United-Kingdom-based Falko Regional Aircraft, China-based Zhejiang Loong Airlines, Jordan-based Petra Airlines, Abu Dhabi-based Falcon Aviation Services and two unidentified customers.

Agreements for firm orders and purchase rights were also signed for 50 of the Japanese Mitsubishi Regional Jet (MRJ), which is powered by the PW1200G geared turbofan, the customers being U.S. start-up Eastern Air Lines and regional carrier Air Mandalay in Myanmar. The PW1700G and PW1900G, the latest additions to the GTF family of engines, will power airframer Embraer's new E2 jets. Trans States Holdings has placed orders and taken out options for 100 E175 E2 jets equipped with PW1700G engines.

Finmeccanica – Selex ES and Thales Team up to Address UK-French Unmanned Combat Air Systems Sensor Requirements

Finmeccanica – Selex ES and Thales welcome the signature of the FCAS Arrangement between the United Kingdom and France. Within the UK-French framework, the two companies will cooperate for the development of the multifunction sensor suite and the communication sub-system of the future Anglo-French Unmanned Combat Air System (UCAS).

A two-year feasibility study, expected to be formally contracted before the end of 2014, will see the two companies work collaboratively in a 50/50 split to lay the groundwork for all the sensing systems required for a future UCAS.

In the airborne sensors domain, Finmeccanica – Selex ES and Thales are partners of choice of Ministries of Defence in the UK and France. The agreement will therefore create an unmatched European force in defence electronics, with a broad width of

expertise and experience in Manned and Unmanned Aerial Systems technology.

The indisputable European leadership of the two partner companies in this domain is a guarantee that they will provide a fully integrated sensor suite able to meet the emerging customers' requirements either for Unmanned or for Combat platforms.

The collaboration between the two national champions is articulated in two main streams:

Exclusive agreement for UK-French FCAS sensor cooperation: During the two year Feasibility Phase, the two companies will exclusively collaborate on all sensor requirements for the UK-French Future Combat Air System (FCAS) programme. The two companies will lead the sensor and communication definition package for FCAS, involving other UK and French industry as appropriate. The cooperation also

includes joint technology maturation activities to inform the design activities.

"PERFECTA" Project for the joint development of a digital backbone for the multifunction sensor: Finmeccanica – Selex ES and Thales will also jointly execute a contract from the French Direction Générale de l'Armement (DGA) and the UK's Defence Science and Technology Laboratory (DSTL) to develop the digital backbone (flexible multifunction sensor suite management and processing) for future advanced sensor systems.

By bringing together the sheer wealth of defence electronic expertise of the two respective companies, Britain and France will be able to operate UCAS effectively in a high threat environment. By providing innovative sensor solutions, the companies will also be sustaining and developing sovereign technologies and a critical skills base in the UK and France.

Airbus Defence and Space Improves Air Surveillance Capabilities of Indonesian Air Force

MSSR 2000 I in operation in more than 30 countries now

Airbus Defence and Space provides the Indonesian Air Force with the latest aircraft identification and air surveillance equipment, thus improving the air traffic control and air defence capabilities over the country's more than 15,000 islands. The company has been awarded a contract by SBL Star Technology Pte Ltd., Singapore, to deliver two of its monopulse secondary surveillance radars MSSR 2000 I to equip the mobile air surveillance and tracking systems which will be operated by the Indonesian Air Force. The final delivery will be done beginning of next year.

"Air traffic control authorities all over the world are facing continually increasing air traffic density," said Thomas Müller, Head of the Electronics Business Line of Airbus Defence and Space. "Together with military air traffic, this situation requires a high-performance guidance system ensuring safety, comprehensive data exchange and efficient allocation of airspace. With our system in operation in around 30 countries we have proven our capability to provide a reliable solution."

In air surveillance and air traffic control, secondary radars such as MSSR 2000 I complement primary radars in identifying individual aircraft and establishing a comprehensive recognized air picture. Typically, a primary radar is able to measure the position of an aircraft at a point of time from reflections of the radar beam without giving a clear identification of the aircraft. The secondary radar exchanges messages with all the aircraft in its area collecting detailed information about flight number, destination, etc. To this end, MSSR 2000 I sends out interrogation signals according to the latest Mode S standard and collects the responses. In this way, the secondary radar in close cooperation



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with the primary radar provides a real-time overview of aircraft positions and additional aircraft data which results in a significant improvement in air surveillance and air traffic control.

In the military field, MSSR 2000 I is used for automatic friend-or-foe identification (IFF), thus avoiding friendly fire, i.e. the erroneous engagement of friendly forces. Airbus Defence and Space has delivered IFF systems to several nations for ground and naval applications. Among others, MSSR 2000 I protects all

German Navy ships as well as UK Royal Navy ships and the French Navy's "Mistral" class command ships. In Germany, the company has established the air traffic control network of the German Luftwaffe covering an airspace of 1.700 x 1.500 km. In total, about 400 Airbus Defence and Space systems are in operation in around 30 nations, including the U.S. For civil air traffic control purposes it is in service in Austria, Portugal, and the Philippines.

F-35 Flight Test Program Milestones Maturing Combat Capabilities

The Lockheed Martin, F-35 Joint Strike Fighter (JSF) program continued a steady path of flight test milestones in August, including weapons separation, software compatibility and flight hours, all demonstrating program maturity.

“The test milestones are a direct result of the detailed planning, coordination and execution between various government teams and the integrated test force,” said J.D. McFarlan, Lockheed Martin’s Vice President for F-35 Test & Verification. “Every testing milestone demonstrates the development of the F-35 in successive steps toward enabling the U.S. Marine Corps to attain its F-35B Initial Operational Capacity (IOC) next year.”

F-35A aircraft AF-1 accomplished its 400th flight during a successful GBU-31 Joint Direct Attack Munition (JDAM) aircraft separation test on Aug. 13 at Edwards Air Force Base, California. This was the first GBU-31 Mark-84 (2,000-pound guided munition) separation demonstration from the F-35. Previous GBU-31 separations were with the BLU-109 (Bomb Live Unit) bomb body.

F-35B aircraft BF-1 and BF-4 completed “Mode 4” formation testing on Aug 9th, as required for Block 2B software capability. “In Mode 4 operations, the STOVL Propulsion System is engaged, the lift fan, roll post nozzle, and three-bearing-swivel nozzle are operating, and all propulsion system doors and inlets are open. Flight testing validated the F-35B Short Take



F-35B aircraft BF-1 and BF-4 fly together in Mode 4 formation near NAS Patuxent River

Off and Vertical Landing (STOVL) variant’s ability to operate well in this configuration during formation flight which supports operations around the ship; a key milestone for the F-35B path to IOC,” McFarlan said.

F-35B aircraft BF-3 completed the 2B software fleet release weapon separation requirements for the F-35B with two successful AIM-120 Advanced Medium Range Air-to-Air Missile (AMRAAM) Air Vehicle Instrumented (AAVI) separation flights on consecutive days, Aug. 14 and 15. The AIM-120 radar-guided missiles were launched over the Atlantic Test Range. “2B software fleet release is critical to the warfighter because it delivers the first combat capability to our most dominant 5th generation platform. Weapons employment is one the most critical combat

capabilities. This culminates years of dedicated work that proves safe separation in 2B configurations and provides this capability and confidence to our customers,” McFarlan said.

Along with the testing milestones, to date, the overall System Development and Demonstration (SDD) F-35A test fleet surpassed its 4,000th flight hour on Aug. 14 and in total, the F-35 Fleet has surpassed 19,500 flight hours, with more than 8,000 hours in SDD aircraft. F-35A aircraft AF-1 achieved its 400th flight milestone on Aug. 13; F-35A aircraft AF-4 surpassed 500 flight hours, Aug. 11 and F-35C aircraft CF-2 achieved 300 flights on Aug. 14.

The F-35 Lightning II, a 5th generation fighter, combines advanced low observable stealth technology with fighter speed and agility, fully fused sensor information, network-enabled operations and advanced sustainment. Three distinct variants of the F-35 will replace the A/OA-10 Thunderbolt II and F-16 Fighting Falcon for the U.S. Air Force, the F/A-18 Hornet for the U.S. Navy, the F/A-18 and AV-8B Harrier for the U.S. Marine Corps, and a variety of fighters for at least 10 other countries. Following the U.S. Marine Corps’ planned 2015 IOC, the U.S. Air Force and Navy intend to attain IOC in 2016 and 2018, respectively.



F-35B aircraft BF-3, piloted by USMC Maj Michael Kingen, fires an AIM-120 Advanced Medium Range Air-to-Air Missile (AMRAAM) in the first live fire test from NAS Patuxent River, Md., Aug. 14.



Alenia Aermacchi Focuses on Turkish Market

The Turkish aeronautics sector offers strong prospects for Alenia Aermacchi, which is currently promoting its industrial and technological capabilities in integrated training systems, special versions aircraft (for maritime patrol and anti-submarine warfare roles) and tactical transport aircraft. The supply of the ATR 72 ASWs (Anti-Submarine Warfare) to the Turkish Navy represents an important industrial co-operation in the aeronautics sector.

On **July 2012** Alenia Aermacchi has signed an agreement with Undersecretariat for Defence Industries (SSM) to deliver two ATR 72-600 TMUA (Turkish Maritime Utility Aircraft, already delivered to the Turkish Navy in July and August 2013) and six ATR 72-600 TMPA (Turkish Maritime Patrol Aircraft) to the Turkish Navy. The contract calls for strong industrial collaboration between Alenia Aermacchi and Turkish Aerospace Industry (TAI) for the duration of the project.

Designed, developed and manufactured by Alenia Aermacchi for anti-submarine warfare (based on the civil ATR 72), the ATR 72 ASW is a highly-efficient medium-range aircraft, with competitive purchase and operating costs, and is also able to conduct maritime patrol missions.

Thanks to the agreement, the Turkish Navy will obtain the last generation ATR72-600 equipped with a glass cockpit as well as more powerful engines that guarantee best performance and supportability for the

next 30 years.

The C-27J tactical transport aircraft produced by Alenia Aermacchi is an optimum solution for Air Force with demanding military mission requirements and larger strategic airlift, now offered also in the MC-27J multi-mission version armed with direct and indirect weapons for special forces use. Its interoperability and common use by other NATO partners would provide the Turkish Air Force with a strong transport capability to participate in multinational activities such as peacekeeping, humanitarian relief and disaster response. The C-27J is interoperable with the A400M with making use of the same cargo pallets. The C-27J is fully

autonomous and can be operated in many out-of-theatre scenarios .

In the field of Integrated Training Systems Alenia Aermacchi has developed an advanced system to accompany student pilots from flight school entry up to lead-in fighter training, guaranteeing a highly effective training course, while allowing air forces to achieve significant cost reductions.

Alenia Aermacchi has developed an advanced system to accompany student pilots from flight school entry up to lead-in fighter training, guaranteeing a highly effective training course, while allowing air forces to achieve significant cost reductions.

Today, Alenia Aermacchi is the only



company in the world to offer complete and integrated training systems. Thanks to its range of trainer aircraft, Alenia Aermacchi can cover the pilot's complete training syllabus, from the screening and primary phase on the lightweight propeller-driven SF-260TP, to the basic phase on the low-cost, yet proficient, single-engine turboprop-powered M-345, up to the advanced and LIFT (Lead-In Fighter Training) phase on the twin-engine M-346, which is unanimously known as its category leader. All this is further supported by a complete Ground Based Training System (GBTS) which includes specific simulators and computer based didactic devices for each aircraft.

Alenia Aermacchi offers to its customers a complete ITS, Integrated Training System, supplying all the elements required to build up a comprehensive flight academy, from the TNA (Training Needs Analysis) to the ground infrastructure design (classrooms, simulators, storage rooms, flight line devices, service hangars, etc.), through the supply of an advanced Training Management Information System (TMIS), essentially an IT system working as the school "Director".

Screening and primary training: SF-260, an evergreen classic. For the screening and the so-called Phase 1 primary training, Alenia Aermacchi offers the SF-260 of which more than 900 have been delivered so far, today proposed in two versions with a 260hp fully aerobatic Lycoming AEIO-540 piston engine, and a 350shp Rolls-Royce Model 250 turboprop. The latter variant, designated the SF-260TP, offers high performance using jet fuel,

particularly in hot-and-high condition.

However latest training and industrial requirements, together with further reduced defence budget are pushing Alenia Aermacchi to look to new solution capable to satisfy both screening and primary training.

Between the years 1990-1993 Alenia Aermacchi (at that time SIAE Marchetti), provided to Turkish Airforce 40 SF-260, that were locally built in Turkish Aerospace Industry (TAI) using the components produced by SIAI Marchetti.

Currently the fleet is still in service for training the pilots of the Turkish Air Force.

Thanks to its superior aerodynamics, side-by-side layout (rather than tandem) of the cabin seats, allowing a



better interaction between the student and instructor and the automatic fuel management system, the SF-260TP is specifically fitted for student pilots to make their first flights in total safety. Its high manoeuvrability, performance level, and advanced avionics allow the aircraft to extend the training Phase 1, which is typically limited to basic



flying activities, navigation and to the instrumental flight and landing.

The latest version of the SF-260TP features a "glass cockpit" with two 15 x 20cm LCD displays integrated with a Control Display Unit (CDU) to manage the various operating modes, and VOR/ILS, ADF, DME, GPS, ADI and HSI systems. Furthermore an infrared camera installed under the right wing provides an Enhanced Vision System for safer night navigation or in case of bad weather conditions. All these characteristics make the SF-260TP also perfectly suitable to cover the first part of the basic training (Phase 2) that normally includes instrument and formation flights.

Basic training: M-345, the revolution.

For the Phase 2 training segment, in the past Alenia Aermacchi has proposed the successful MB-339, currently in service with several air forces around the world. However, this excellent aircraft is now planned to give way to the brand new M-345 HET (High Efficiency Trainer) which is being developed and scheduled to enter service starting from 2017.

The M-345 originates from the SIAI Marchetti S.211A, of which it maintains the basic advanced aerodynamic design, which includes a supercritical wing airfoil, whereas some structural components, the engine of 1550kg thrust class, avionics and systems are completely new.

With the M-345 HET Alenia Aermacchi decidedly takes a new direction, proposing a solution which guarantees a cost-effective ratio lower than the modern "heavy" turboprop trainers from the USA, Brazil and Switzerland. Compared to these aircraft, the M-345 features decidedly higher performance, specifically with regard to the transfer speed to the training range and the altitude, leading to a drastic reduction of "idle times" in each training session, because within the representative flight hour



the student pilot can perform a higher number of tasks included in the Training Needs Analysis thus completing the syllabus in a 25% shorter time period (from the standard 120 hours down to 90).

Obviously, a turbofan burns more fuel than a turboprop, in this specific case averaging 30% more, but the M-345 performance, together with its advanced avionics including a Digital Moving Map, Store Management System and outstanding Embedded Tactical Training System (ETTS) allow to extend the basic training phase up to the introduction of air combat tactics, thus anticipating the next advanced training phase which the student pilot can reach with higher skills, thus reducing the flight hours needed on an advanced trainer.

Speed is important for training so the M-345 significantly reduces the transfer time to the training areas because, thanks to its ability to maintain a cruise speed of 300KTS at altitudes higher than 20,000ft, it can use the commercial airways without interfering with the civilian traffic, unlike turboprops which cannot fly with airliners because they cannot exceed 240KTS at those altitudes.

In a typical air-to-air training engagement, the M-345 compared to a heavyweight turboprop, has a maximum speed at altitude of 425KTS, against the 334 of the fastest turboprop trainer and around 300 of the average turboprop trainers.

Speed is even more important for the air-to-ground engagement training, where the whole procedure of target approach, weapon release and escape must comply with a precise schedule. In low altitude tactical navigation, conventional turboprop trainers, featuring a traditional aerodynamic configuration, typically maintain a cruise speed of 240KTS, whereas the fastest among them, featuring a more advanced aerodynamics and increased engine power, can reach a value of 300. In the same conditions, the M-345 can navigate at 360KTS: a noteworthy difference for this training mission in this phase.

A faster aircraft means getting the student pilot familiarized with very short reaction times and thus, more similar to those to be sustained in the advanced training phase, as they fly at a performance level more similar to those required in real missions.

With the M-345, flying the same



number of flight hours the student pilot can complete Phase 2 with a significantly higher skill level, also including the management of sensors and weapons and the air-to-air and air-to-ground engagement procedures. In concrete terms, the air force can reduce the basic phase flight hours, for instance, from 120 to 90 or maintaining the 120 hours including the introduction to tactics, thus reducing Phase 3 on the advanced trainer from 70 to 50 hours (more than 28% less), and achieving great economic savings.

Advanced training and LIFT phases: M-346, the market leader.

Alenia Aermacchi's system guarantees the best cost-effectiveness ratio also for the advanced training (Phase 3) and Lead-In Fighter Training (LIFT), which are indeed the most expensive yet also the most important phases of the whole training course.

For instance, it is enough to think that the same air forces which use the advanced high-speed turboprop trainer for both basic and advanced trainings for a total amount of 220 flight hours, must then perform a roughly 150 flight hour operating conversion period on the fighter twin-seat variant with each flight hour costing estimately 20-30 times more than with a basic aircraft.

The LIFT phase is even more important for those air forces which operate fighters with only single-seat variants, such as the F-22 and the F-35, because the idea to have a pilot flying the first time on a fifth generation fighter directly coming from turboprops, is unrealistic and unsafe.

With the M-346 and its Ground

Based Training System, Alenia Aermacchi solves this issue without disregarding cost containment.

The M-346 characteristics and its Integrated Training System have been defined as allowing recreating the virtual scenarios for each training session.

The M-346 stands out for its manoeuvrability at a high angle-of-attack, over 35° (it is able to sustain load factors up to +8/-3 g), and also for its ability to reach transonic flight speeds (in levelled flight it sustains 590 KTS and rates of climb of 22,000ft per minute, allowing the student pilots to try their skills in tactics with reaction times similar to those of fighters. For instance, from take-off brake release up to the achievement of 40,000ft altitude, the M-346 takes 3 minutes, against the average 2 required by a modern fighter.

Older advanced trainers with traditional design yet still in production and on the market take more than 12 minutes. Furthermore, the M-346 offers such performance despite lacking an afterburner because it would significantly increment the flight hour average cost and the aircraft maintenance cost. The high fuel consumption of an afterburner engine would also reduce the aircraft endurance at the expense of training session duration.

For example in a given mission the M-346 has an average burn of 55kg of fuel per minute to get maximum performance, whereas its supersonic competitor - which, in order to reach the same manoeuvre performance as the M-346 must use the afterburner - burns more than three times.

Furthermore, the M-346 offers

very high safety levels, thanks to its twin-engine solution (based on the turbofan Honeywell F-124-GA-200) equipped with FADEC (Full Authority Digital Electronic Control) and to the quadruple redundant fly-by-wire flight controls. The latter, further to guaranteeing the care-free handling, can be reprogrammed to impose limits for maximum angle-of-attack, load factors, rolling rate and stall prevention threshold, starting with a “less performing” aircraft and afterwards increasing its capacities as student pilots’ progress within their training.

The GBTS component developed by Alenia Aermacchi for the M-346 Integrated Training System is the most complete and advanced in the world. Further to the e-learning system, the procedural simulator and a 180° display simulator called the Part Task Trainer (a type of advanced version of the Phase 3 OFT), Phase 4 also provides for a Full Mission Simulator (FMS) whose 360° cupola visual guarantees an “extreme” realism.

The simulator cockpit is just like the real one and reacts exactly the same as the original, meanwhile the virtual map resolution, which reaches 50cm, makes the simulated experience unbelievably effective. Furthermore, the simulator also allows for the use of the NVG (Night Vision Goggles) and the HMD (Helmet Mounted Display).

With two simulators, two student pilots can test their ability in collaborative missions in pairs, both with their own virtual aircraft, or in air engagement. Alternatively, one of the two simulators can be equipped, by means of a proper “roll-in/roll-off” system, with the Weapon Systems Officer rear cockpit, in order to simulate a mission with pilot and system operating in pairs on the same aircraft.

The simulators can replicate any tactic situation, because the system can generate and manage an infinite number of “synthetic” units to populate the scenario.

In the Advanced and LIFT training phases, the simulator is crucial to prepare and test the missions before flight.

The M-346 GBTS system cannot be considered a mere tool to reduce costs replacing the flight hours. In fact, thanks to the integration of the ground simulator with the aircraft ETTS throughout the datalink, the concept of Live Virtual Constructive (LVC) simulation can be implemented by networking via datalink the aircraft



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(Live), the simulator (Virtual) and the ETTS (Constructive) within a distributed operating environment.

The last upgrade of the ETTS allows the student pilots to visualize the virtual aircraft entering their visual field through the Helmet Mounted Display.

The on-ground instructor supervises all training phases through the Real Time Monitoring Station (RTMS) connected to both simulators and flying aircraft (via datalink). Thanks to this feature, the instructor can intervene modifying the scenario in real-time, for instance adding or deleting a threat.

Among the Integrated Training System ground infrastructures the Mission Planning Debriefing Station (MPDS) is also noteworthy, where

the instructor and the student pilot plan their missions and perform their debriefing.

The MPDS allows the student pilots to become accustomed to approaching the training missions, be they real or virtual flights, with the same modalities of a real mission, planning all details on ground.

In the same way, at the end of the mission, the debriefing is performed downloading all data collected during the flight. All this information is then transferred to the Training Management Information System, the above mentioned virtual school “Director” which records all tasks performed by the student pilots.



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Russian Helicopters Completes Delivery of 52 Mi-171E Helicopters to China

Russian Helicopters, a subsidiary of Oboronprom, part of State Corporation Rostec, announced that Ulan-Ude Aviation Plant has delivered four Mi-171E transport helicopters to China's Poly Technologies, the final consignment of a contract for 48 helicopters signed by Rosoboronexport in 2012. In total under the original contract and a follow-on agreement the Chinese company has received 52 helicopters.

"The successful completion of this large contract to supply Mi-171E helicopters is another step towards strengthening successful cooperation between Russia and China," said Ulan-Ude Aviation Plant Managing Director Leonid Belykh. "Our helicopters have demonstrated their unique capabilities in action in China, and are deservedly in high demand in this fast-growing and high-potential market."

The new helicopters are equipped to produce exceptional performance in mountainous terrain, including VK-

2500 engines delivering increased power, a Safir auxiliary power plant and updated gearbox. Additional internal fuel tanks, a searchlight and landing seats significantly expand the helicopters' operational options.

Chinese crews have successfully completed training at the Ulan-Ude Aviation Plant's training centre, where they learned techniques and rules for piloting the helicopters in various conditions using advanced training methods on the latest Mi-171 flight simulator. The pilots praised the comfort and ease of use of the simulator, its consistency with a real helicopter and the high level of competence of the training centre staff.

Mi-171E operates successfully across China, in particular in areas with challenging terrains and harsh climates. They are used to carry cargo including medical supplies, humanitarian aid and construction materials. Russian Helicopters and Ulan-Ude Aviation Plant have received



Mi-171E transport helicopter

numerous appreciative reviews of the helicopters' ultra-reliability when dealing with emergency situations.

China is one of the biggest operators of Russian-made helicopters, and has a fleet of about 160 Mi-171s. Russian Helicopters is currently developing the latest model in this renowned series, the Mi-171A2, and Ulan-Ude Aviation Plant is making preparations to put the model into serial production.

Boeing Awarded \$250 Million Contract to Modernize NATO AWACS Fleet

Boeing has been awarded a \$250 million production contract to upgrade the flight deck and avionics on NATO's fleet of 13 AWACS aircraft. The digital flight deck (shown here) already has been installed on one NATO AWACS as part of an earlier Engineering, Manufacturing and Development contract

Boeing has received a contract from NATO worth approximately \$250 million to install digital flight decks and avionics on 13 of the alliance's Airborne Warning and Control System (AWACS) aircraft, which are based on the Boeing 707 commercial airplane.

The new technology ensures compliance with current and future air traffic control and navigation requirements, giving the aircraft broader access to airspace around the world.

"Increasing airspace access means greater mission efficiency by saving time and fuel during operations," said Jon Hunsberger, Boeing AWACS program manager. "The improvements

also provide the pilot and co-pilot user-friendly and customizable engine, navigation and radar data."

Additionally, the upgrade will result in a cost savings in personnel because the flight deck crew will be reduced from four to three. It also solves the challenge of finding out-of-production avionics for the AWACS fleet by utilizing readily available commercial-off-the-shelf digital avionics. The modifications begin in 2016 and will be completed by 2018.

Under an earlier Engineering Manufacturing and Development (EMD) contract, Boeing installed a new digital flight deck and avionics on one NATO



AWACS. Flight testing begins in the fourth quarter of this year with delivery scheduled for December 2015. As part of the EMD contract, Boeing also will upgrade the flight deck and avionics of a U.S. AWACS aircraft beginning this November.

Finmeccanica - AgustaWestland Signed a Contract Worth EUR 113 Million with the UK Ministry of Defence

Finmeccanica – AgustaWestland has signed a contract with the UK Ministry of Defence (MoD) valued at EUR 113 million (£90 million) to integrate, test and install the Future Anti-Surface Guided Weapon (FASGW) Heavy and Light missile systems onto 28 Royal Navy AW159 Wildcat helicopters.

The two missiles are the MBDA FASGW(Heavy)/ANL (Future Anti Surface

Guided Weapon (Heavy)/ Anti Navire Léger) and the Thales Light Multirole Missile (LMM) (FASGW (Light)). Both will be integrated onto the AW159 Wildcat to give it the ability to attack a wide range of surface targets. The company is manufacturing 62 Wildcat helicopters for the UK MoD, 28 of which will be operated by the Royal Navy and 34 by the British Army. The Wildcat is replacing

the Lynx helicopter. This contract is yet another confirmation of the long and successful working partnership between Finmeccanica - AgustaWestland and the UK Ministry of Defence. The Company has been providing helicopters for the Armed Forces for decades, together with a wide range of comprehensive training and support services

Northrop Grumman Continues to Expand Its Supply Chain Partnerships Throughout Australia

Partnerships throughout Australia Australian companies awarded contracts by Northrop Grumman totalling more than \$14 million through the Australian DMO global supply chain program

Northrop Grumman Corporation continues its efforts to partner with leading Australian companies to develop the company's global supply chain in Australia. Northrop Grumman has contracted with more than 15 different Australian small and medium enterprises in either a first tier subcontractor role or lower tier supplier role. Australian small and medium enterprises have been contracted to support Northrop Grumman on a variety of missions, providing subcontractor support on U.S. Government and U.S.

military aircraft programs, cutting-edge space studies, critical cyber security initiatives and logistics. In total, the company has awarded Australian companies contracts totalling more than \$14 million to date.

Most recently, Northrop Grumman issued requests for information and rough order of magnitude pricing solicitations to 10 Australian small and medium enterprises in support of High Altitude Long Endurance programs. These solicitations, for work in the areas of composites, sheet metal, and

machined parts and tubing, included over 900 parts for bid.

The work includes both aircraft part manufacturing and post-delivery sustainment activities, with a potential total value of more than \$115 million over the life of the program. Northrop Grumman will continue its solicitation process to find best-value Australian suppliers and will leverage the recent acquisitions of M5 Network Securities and Qantas Defence Services to further expand its Australian supply chain.

OTO Melara Expands its Presence in Poland

OTO Melara signed a license agreement with the Polish company WZM Siemianowice for the assembly, integration, local production, maintenance, repairs and overhaul up to the third level of the HITFIST® 30mm turret.

The license, that will be provided within the framework of the offset agreements completely free of charge,

covers a period of 20 years with an option for further 10 years and shows the willingness of OTO Melara to continue the collaboration with the Polish Defence industry that started in 2003.

The agreement has been signed by Ulderigo Rossi, Marketing and Sales SVP and Adam Janik, Chief of WZM Siemianowice.

The Polish Army has in service 570 Rosomak wheeled armoured vehicles 376 of which in "Combat" version and, in October 2013, another order to the Finnish company Patria for further 307 base chassis Rosomak has been signed with the possibility for further supplies. It is intention of the Polish MOD to install, on most Rosomaks, 30mm turrets equipped with Spike missiles.

STREIT Group Offer a Range of Armoured Vehicles to the Potential Client

STREIT Group, founded in Canada in 1992 is the world's leading privately owned armoured vehicles manufacturer specializing in engineering, manufacturing and prototyping of armoured civilian and military vehicles. With a large variety of Armoured Personnel Carriers (APC's) and Mine Resistant Ambush Protected (MRAP's) vehicle models as well as extensive stock of armoured commercial and special purpose vehicles at any given time - STREIT Group is capable of meeting all customer requirements in today's demanding markets. STREIT Group was founded in Canada in 1992 by Chief Executive, Guerman



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Goutorov; the company began as nothing more than a handful of tools, a rented garage and some overextended credit. Guerman Goutorov's vision was to create safe, innovative and cost effective life protection vehicles that the market had never seen. Today, STREIT Group employs a workforce of more than 1,000 employees with twelve production plants and 25 offices around the globe with a capability to produce more than 500 armoured vehicles per month. In addition to armoured vehicles, STREIT group has introduced a new service to its extensive portfolio: "STREIT Defence & Emergency Training Courses".

The personnel training programs are tailor made for Police, Special Forces, Security Agencies, Diplomatic Missions and Military Training. There are more than 120 specialist Defence & Emergency Training courses available, each one can be designed around the client's needs in order to fulfill any requirements and can vary from three days to six months. STREIT Group security instructors are qualified specialists from Europe with Police and Military background as well as many years of practical experience in challenging and hostile environments.



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Rheinmetall to Furnish Greece with Tank Ammunition Worth over €50 Million: Initial Supply for Leopard 2 tanks

Rheinmetall has won an important foreign order for large-calibre ammunition. Greece has contracted with the Düsseldorf-based defence contractor to supply the Hellenic armed forces with tank ammunition worth some €52 million.

The order encompasses 12,000 rounds of 120mm ammunition, the initial supply for the Greek Army's Leopard 2 tanks. Greece bought the tanks back in 2009; procurement of the accompanying ammunition was delayed for several years.

Just signed, the contract represents a breakthrough in finishing the task of re-equipping the Greek Army's tank forces.

Under this procurement project

Germany's Federal Office of Bundeswehr Equipment, Information Technology and In-service Support (BAAINBw) in Koblenz is the actual customer, acting on behalf of the Greek Ministry of Defence in a context of mutual cooperation and assistance. This substantially simplifies and accelerates the procurement process, enabling the Greek authorities to dispense with the costly accumulation of expertise in the field of ammunition procurement – especially with regard to technical inspections.

The defence ministries of Germany and Greece laid the contractual groundwork for this procedure in an agreement reached at the beginning of 2014.

Specifically, the contract calls for the supply of 120mm DM12A2 multipurpose ammunition as well as DM63 and DM63A1 kinetic energy (KE) rounds. It also includes the production and installation by Rheinmetall of ballistic tables for the KE ammunition in the Greek Leopard 2A4.

Two of these ammunition types, the DM12A2 and the DM63, will be supplied to the Greek Army by the end of 2014 in order to meet an immediate requirement. The remainder of the ammunition (DM63A1) will be delivered in three lots in 2015 and 2016 following the planned new qualification of this round early next year.

Finmeccanica - Selex ES Awarded Multi-Million Euro Contract from SAAB for Raven AESA Radar on Board the Gripen Next Generation (NG) Fighters

A multi - million contract has been awarded to Selex ES by defence and security company SAAB to supply the Raven ES-05 AESA (Active Electronically Scanned Array) radar for SAAB's Gripen Next Generation (NG) fighters.

A NATO-interoperable, multi-role fighter designed for the future network-centric warfare environment, Gripen NG will provide superior situation awareness thanks to a number of Finmeccanica – Selex ES products. In addition to the Raven ES AESA radar, the company will also provide the Skyward-G IRST (Infrared Search & Track) passive sensor and IFF (Identification Friend-or-Foe) system, both of which will be contracted for in the next few months.

Finmeccanica - Selex ES's participation in the Gripen NG programme dates back to 2009, when an agreement was signed with SAAB for the development of the Raven ES AESA radar. This was followed in 2010 by the selection of the Skyward-G IRST sensor and the IFF system.

A production-standard Raven AESA radar is now installed on Gripen demonstration aircraft, while flight tests with the Skyward G IRST have been underway since March, achieving excellent results and demonstrating the



value of a passive sensor as an integral part of a weapons system. The IFF system will be delivered later in the year.

In a recent development, Finmeccanica – Selex ES's new BriteCloud Expendable Active Decoy (EAD) has been chosen as an electronic warfare option for the Gripen NG and all other versions of the aircraft. Currently, the BriteCloud EAD is the only product of its type on the market and SAAB will be the first partner to offer the new decoy, boosting the desirability of Gripen NG for new customers. Live BriteCloud trials on-board the platform are expected to take

place by the end of 2014.

Currently, Gripen C/D versions are in service in Sweden, South Africa, Hungary, Czech Republic and Thailand. Gripen NG is in full scale development for Sweden and has been down-selected and in final negotiations for Brazil.

The capability and price of Gripen NG makes it a highly attractive proposition and there is growing interest world-wide. With retrofit opportunities on the Gripen C/D and new Gripen NG purchases, Finmeccanica – Selex ES expects to provide up to 200 sets of sensor equipment over the next 10 – 15 years.

Eurofighter Submits Bid to Denmark

Typhoon fighter proposed to replace F-16 fleet

Airbus Defence and Space has submitted its bid in response to the Danish Ministry of Defence's tender for the replacement of Denmark's fleet of F-16 fighters.

On behalf of Eurofighter it confirms that the Eurofighter Typhoon meets all of Denmark's requirements for its future fighter.

Eurofighter Typhoon is combat proven and 100 percent-integrated within NATO. A partnership within the Eurofighter community exists for the entire life of the aircraft, which will

be the next 40-50 years. This would allow Denmark to have a modern well-equipped combat aircraft that can perform all necessary tasks and missions.

The many Typhoon aircraft in the neighboring area also means that the cost of spare parts, operation and maintenance as well as development and upgrade will be kept to a minimum - and that Denmark's participation in international missions will take place together with Typhoons from other European NATO member

countries.

After the delivery to the Ministry on Monday 21 July, Uli Fingerle, Eurofighter campaign director said: "It gives us great pleasure to offer Denmark our proposal for the most advanced multi-role/swing-role aircraft currently available. We are convinced that, with its strong partnership between European nations and more than 400 aircraft already in service, Eurofighter is the rational choice for Denmark."

First Two Australian F-35s Roll Out Of Factory

A ceremony was held today at Lockheed Martin, commemorating the official roll out of the first two F-35 Lightning II aircraft for the Royal Australian Air Force (RAAF).

"Today, we celebrate a milestone in the U.S.-Australia partnership, a partnership built on strength, friendship, and technological innovation," said Frank Kendall, U.S. Under Secretary of Defence for Acquisition, Technology & Logistics. "We join Australia, as one of our original partners, to celebrate this roll out and the numerous Australian contributions to the Joint Strike Fighter program. For both our nations, this program represents an exponential leap in capability on the cutting edge of technology -- and an integral component of our ongoing joint commitment to stability and peace in the Asia-Pacific."

Joining Mr. Kendall at the ceremony, among various distinguished guests in attendance, were Air Marshal Geoff Brown, Chief of RAAF; and Marillyn Hewson, Lockheed Martin chairman, president and CEO.

The F-35 Lightning II aircraft will provide the Royal Australian Air Force with a transformational 5th generation fighter capability and provides significant



Royal Australian Air Force Air Marshal Geoff Brown delivers his remarks at the roll out ceremony for Australia's first F-35 JSF

benefits to the Australian aerospace industry, with more than \$412 million (USD) already contracted and up to \$6 billion (USD) in expected manufacturing orders over the life of the program.

"It's fitting that in the year Australia commemorates 100 years of military aviation, we also mark the arrival of the most advanced fighter ever developed," said Marillyn Hewson, Lockheed Martin chairman, president and CEO. "The F-35 Lightning II will lay the foundation for the next century of Australia's military air

power."

The aircraft, known as AU-1 and AU-2, are scheduled to undergo functional fuel system checks before being transported to the flight line for ground and flight tests in the coming months. The jets are scheduled to be delivered to the Royal Australian Air Force later this year, and will be based at Luke Air Force Base, Arizona, where they will be used for Australian and partner country pilot training.

ATK and Alenia Aermacchi Successfully Complete Testing on Italian Air Force C-27J with Roll-On/Roll-Off Palletized Gun Systems

ATK announced that the ATK and Finmeccanica-Alenia Aermacchi have successfully completed the first phase of ground and flight testing of the fully configured multi-mission MC-27J tactical transport aircraft with the support of the Italian Air Force (ITAF). The series of tests exceeded all test objectives and demonstrated the accuracy of ATK's side-mounted GAU-23 30mm cannon.

The ITAF MC-27J aircraft was modified with an L-3 Wescam MX-15Di Electro-Optical and Infrared Turret mounted under the nose of the aircraft to support multi-mission applications such as a Gunship, Intelligence,

Surveillance and Reconnaissance (ISR) and Search and Rescue (SAR) missions; various radio and data links and ATK's Roll-On/Roll-Off (RORO) palletized gun and mission control systems.

ATK and Alenia Aermacchi believe that: "The completion of successful testing with the Italian Air Force further validates the capabilities of the RORO gun and mission systems and demonstrates that the program is ready for fielding. This testing builds on previous gun accuracy flight tests done with the MC-27J at Eglin AFB in 2013 and will provide the aircraft with a vital capability and a greater mission

flexibility at an affordable cost."

The MC-27J is an advanced multi mission system jointly developed by ATK and Alenia Aermacchi, based on the C-27J, the most state-of-the-art twin-engine turboprop tactical transport aircraft currently available on the market that provides unequalled performance.

ATK and Alenia Aermacchi announced their intent to jointly develop and market the MC-27J multi-mission aircraft at the 2012 Farnborough Air Show. The internally funded test and development program successfully completed its first phase in the spring of 2013.

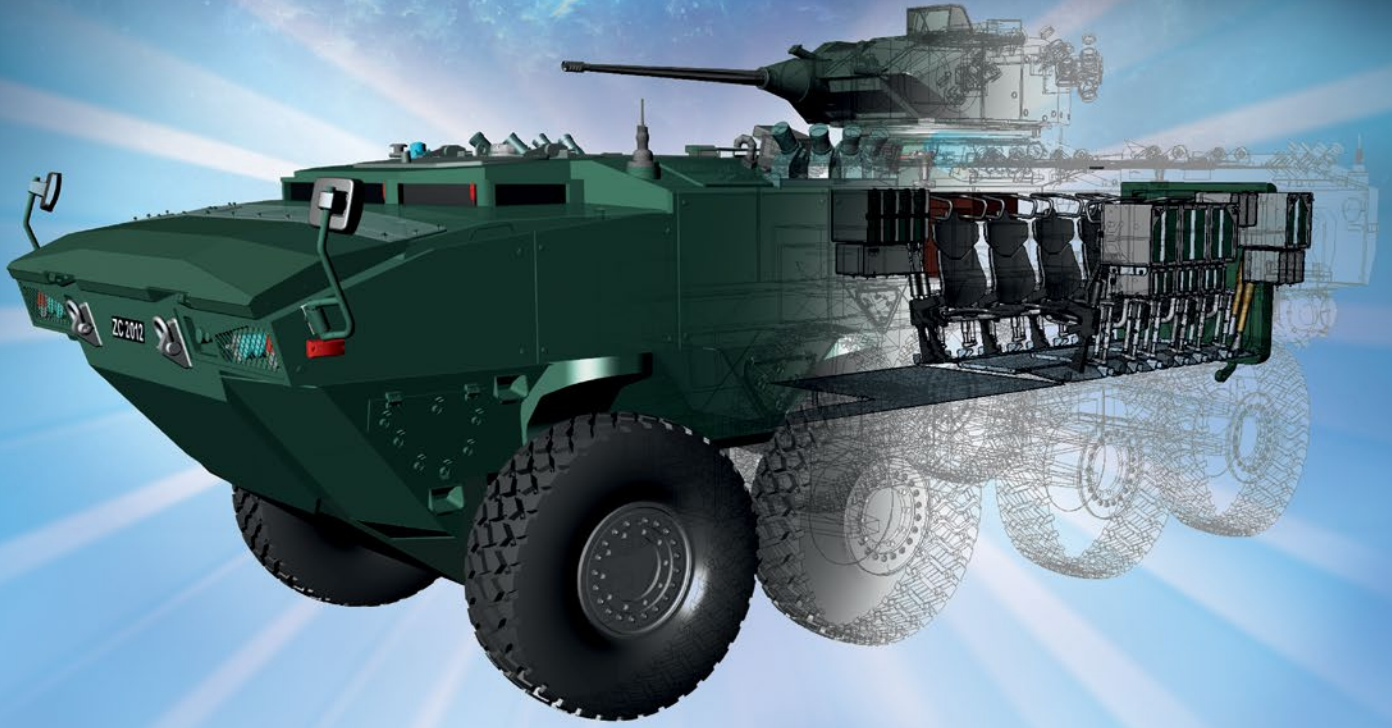
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