

# MMSI

ISSUE: **31**  
November 2016 / 13

■ AEROSPACE ■ DEFENCE TECHNOLOGIES ■ STRATEGY

**IDEAS**  
**2016**   
**SPECIAL**  
**ISSUE**



**A Proud Day for STM:  
Pakistan's Fleet Tanker Launched**





**YALÇIN 4x4**



# HIGH PROTECTION INDIGENOUS DESIGN OPERATIONAL EFFICIENCY

EJDER YALÇIN 4x4, manufactured by Nurol Makina, is a unique platform developed to meet the operational needs of security forces and military troops in all weather, terrain and environmental conditions. EJDER YALÇIN 4x4, with high protection level, large internal volume and mobility, is a combat proven armoured vehicle of challenge area requirements.

EJDER YALÇIN 4x4, offers customized solutions for distinctive operational needs of users as Border Surveillance & Security Vehicle, Recce Vehicle, Command & Control Vehicle, Combat Vehicle, Personnel Carrier, CBRN Monitoring Vehicle and Armoured Ambulance.

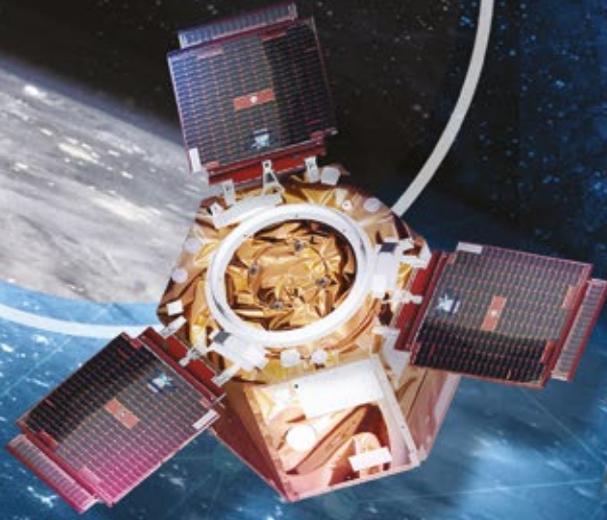
[www.nurolmakina.com.tr](http://www.nurolmakina.com.tr)  
[info@nurolmakina.com.tr](mailto:info@nurolmakina.com.tr)

Ankara Organize Sanayi Bölgesi  
Avrupa Hun Caddesi No:6  
Sincan - ANKARA / TURKEY  
Phone: +90 [ 312 ] 267 05 30 • Fax: +90 [ 312 ] 267 01 55



# GÖKTÜRK-2

EO SATELLITE SYSTEM



# HÜRKUŞ

NEW GENERATION  
BASIC TRAINER



# ANKA

MULTI ROLE ISR SYSTEM



# T129 ATAK

ADVANCED ATTACK & TACTICAL  
RECONNAISSANCE HELICOPTER



## CENTER OF AEROSPACE

- Design & Integration
- Modernization & Modification
- Production & Assembly
- Support

TAI is a subsidiary of TAFF and an affiliate of SSM.  
[www.tai.com.tr](http://www.tai.com.tr) / [marketing@tai.com.tr](mailto:marketing@tai.com.tr)



# TAI

TURKISH AEROSPACE INDUSTRIES, INC.



## MSI TDR

ISSN: 2149 - 2514

ISSUE: **31**  
NOVEMBER 2016 / 13

## EDITORIAL

**Publisher & Executive Editor**  
Ümit BAYRAKTAR  
ubayraktar@milscint.com

**News Editor & General Coordinator**  
Naile BAYRAKTAR  
n.bayraktar@milscint.com

**Editor-in-Chief**  
Dr. K. Burak CODUR  
b.codur@milscint.com

**Coordinator, Business Development**  
Şebnem ASIL  
s.asil@milscint.com

**Coordinator, Editorial Board  
& International Relations**  
Bırol TEKİNCE  
btekince@milscint.com

**Editor, Strategy & Development**  
M. Emre YAZICI  
e.yazici@milscint.com

**News Desk**  
news@milscint.com

**Reporter**  
Vehbi TUNCA  
v.tunca@milscint.com

**Reporter**  
Özgür Deniz KAYA  
o.kaya@milscint.com

**Art Director**  
Şebnem AKGÖL KARA  
s.kara@milscint.com

**Managing Editor**  
Ferda BAYRAKTAR  
editor@milscint.com

## ADVISORY BOARD

Prof. Dr. Süleyman TÖLÜN  
Prof. Dr. Adil YÜKSELEN  
Prof. Dr. Okan ADDEMİR  
Prof. Dr. Zahir MEÇİTOĞLU  
Prof. Dr. Mikdat KADIOĞLU  
Prof. Dr. Gonca COŞKUN  
Prof. Dr. Yıldırım SALDIRANER  
Asst. Prof. Burak ÇINAR  
Asst. Prof. Dr. Ş. Hakan ATAPEK

**Military Advisor**  
Brigadier General (R) Hüsamettin ESEN

**International Relations Advisor**  
Dr. Savaş BIÇER

**Legal Advisor**  
Sertaç YALÇIN

**Military Science & Intelligence (MSI)  
Turkish Defence Review (TDR)**

Yerel Süreli Yayın

**UMSA Ltd. Şti. Adına Sahibi**  
ÜMIT BAYRAKTAR

Mutlukent Mah. Angora Cad. No: 184/27  
Beysukent Çankaya Ankara TURKEY  
Phone: +90 312 225 41 73 - Fax: +90 312 225 41 74

**Translation Services**  
Nova Translation Ltd.  
Tepe Prime A Blok A 26  
Eskişehir Yolu 9. km Çankaya Ankara TURKEY  
Phone: +90 312 428 04 84

**Printing**  
A. A. Traders  
Shop Nr: 8, Sabrina Centre, Dr. Ziauddin Ahmed Road,  
Pakistan Chowk, Karachi, Pakistan  
Tel: +92 21 32210251

Military Science & Intelligence (MSI) Turkish Defence Review is published by UMSA Co. Ltd. in accordance with the laws of the Republic of Turkey. The name and publishing rights of MSI Turkish Defence Review are the sole property of UMSA Co. Ltd. All rights are reserved related to photographs, maps, illustrations and images. References and citations may be made on the condition that the original source is appropriately cited. Responsibility for the published articles belongs to their authors, while responsibility for the advertisements belongs to the owners. The opinions or claims made in the articles and advertisements do not necessarily represent the views of UMSA Co. Ltd. or MSI Turkish Defence Review.



04

## INTERVIEW

Prof. Dr. İsmail DEMİR, Undersecretary for Defence Industries: "As two brotherly nations, Turkey and Pakistan will continue to cooperate in the field of defence and aerospace, just as they have until now."

12

## INTERVIEW

Lieutenant General (Retd.) Syed Muhammad OWAIS, HI (M), Secretary, Pakistan Ministry of Defence Production: "IDEAS serves as a platform to portray a positive and realistic image of Pakistan."

18

## SSI

Latif Aral ALIŞ, Chairman of the Board of Directors, Defence and Aerospace Industry Exporters' Association Chairman of the Turkish Defence Alliance We Have Confidence in the Future of the Turkish Defence and Aerospace Industry

20

## DEFENCE NEWS

- TCG BÜYÜKADA (F-512) Visits Pakistan
- Ali Fidan Appointed as Undersecretary of the Ministry of National Defence
- STM Cyber Fusion Centre Enters into Service
- STM Becoming a World Brand in Submarine Modernisation
- HAVELSAN Hosts Brigadier General El-Ghanim, Qatar's Chief of General Staff
- STM to Take Part in Europe's New Strategic Cyber Security Initiative
- HAVELSAN Provides the Combat Management System of Romanian Frigates
- ARES Shipyard Preparing for Delivery to Qatar

30

## STM

STM is Heading for the Seas of the World



32

**TAI**

T129 ATAK at the Himalayas

36

**SPECIAL COVERAGE**

A Special Ship with a Special Crew

44

**MILSOFT**

MILSOFT is Ready to Further Share Technology and Experience with Pakistan

48

**NUROL MAKİNA**

EJDER YALÇIN 4x4: Best of its Class

52

**STM**

A Proud Day for STM:  
Pakistan's Fleet Tanker Launched

56

**METEKSAN DEFENCE**

Damage Control Simulator Preparation as well as Knowledge is Vital for Survival

60

**HAVELSAN**

The Largest Local Prime Contractor and Leading Solution Partner of Turkish Naval Forces Command

64

**VESTEL DEFENCE**

KARAYEL: Already Operational and Ready for Future

68

**KAREL**

The Market Leader in Communication Technologies

70

**SDT**

Continues its Export Offensive

72

**ANOVA**

ANOVA: The Design and Engineering Solution Partner of the Turkish Defence and Aerospace Industry

**ADVERTISERS**

STM	Back Cover
Nurol Makina	Inside Front Cover
SSI	Inside Back Cover
TAI	First Page

FNSS	7
Fotoniks	23
IDEF 2017	75
Karel	27
Katmerciler	15
Meteksan Defence	11
MILSOFT	17
MSI TDR	19
OSSA	71
Sarsılmaz	63
SDT	67
Vestel Defence	9
Yonca Onuk JV	51

Anova	22
Ayyazılım	45
BİTES	53
ESNAD Defense	66
Onuk-BG	69
Sempro Danışmanlık	35
TSS News	47
TTAF Savunma	43

Prof. Dr. İsmail DEMİR, Undersecretary  
for Defence Industries:

**“As two brotherly nations,  
Turkey and Pakistan will continue  
to cooperate in the field  
of defence and aerospace,  
just as they have until now.”**

Turkey and Pakistan, which have very close relations in every area, have started to expand the scope of cooperation in the field of defence and aerospace with indigenous products and joint development projects. We talked about the industrial aspect of these developments with Prof. Dr. İsmail Demir, the Undersecretary for Defence Industries.

Ümit BAYRAKTAR  
ubayraktar@milscint.com

K. Burak CODUR  
b.codur@milscint.com

**MSI TDR:** Mr. Undersecretary, first of all, would you please share with us your message to the participants of IDEAS (The International Defence Exhibition and Seminar)?

**Prof. Dr. İsmail DEMİR:** IDEAS is an exhibition to which the Turkish defence and aerospace industry regularly participates under the leadership of the Undersecretariat for Defence Industries (SSM). The exhibition sees significant participation by official representatives, companies and defence professionals from various countries. In this context, IDEAS is a valuable plat-



Pakistan Navy's Agosta 90B class submarine PNS HAMZA



© PN via Usman Shahid

form that provides us the opportunity to consult with Pakistan and other participating countries about cooperation in the defence and aerospace industry. I recommend participants in IDEAS to make the most of the exhibition, and to be in close cooperation with SSM representatives during the event. Our priority target will be to build on the potential cooperation opportunities with other countries – and in particular with Pakistan – during the exhibition, and to return from the exhibition with concrete results.

**MSI TDR:** How would you comment on Turkey's participation to IDEAS?

**Prof. Dr. İsmail DEMİR:** Owing to our existing relations with Pakistan, a brotherly nation, we attach great importance to IDEAS. As always, Turkey will have a strong representation at IDEAS 2016. We are participating to the exhibition with 20 companies and institutions at a 'National Level', under the lead of the SSM. We have secured a total area of 1,100 square metres for [exhibitions of] our defence and aerospace companies. We have arranged the highest possible level of official participation from public authorities. In this sense, we will ensure a broad participation to the exhibition both from the government's side and the industry's side.

**MSI TDR:** As an undersecretary, you had the opportunity to get acquainted with Pakistan's defence and aerospace industry during your visits and bilateral meetings. Can you share with us your assessments on Pakistan's defence and aerospace industry?

**Prof. Dr. İsmail DEMİR:** Pakistan's defence and aerospace industry is largely based around the public institutions. Heavy Industries Taxila, which operates in the field of land vehicles; Pakistan Aeronautical Complex, which operates in the field of air platforms; and Pakistan Ordnance Factories, which operate in the field of ammunition, are only some of the enterprises of Pakistan's Ministry of Defence that operate under state control. [In Pakistan,] the private sector has not yet reached the desired level of involvement in the field of defence. In December 2015, I was invited to a seminar that was held in Pakistan. During this seminar, I made a presentation on the 'Turkish Public-Private Partnership Model for the Defence Industry', and observed that the Government of Pakistan is making a significant attempt to increase the involvement of the private sector in the defence and aerospace industry, placing great importance on the partnership between the public and private sectors.

**MSI TDR:** Likewise, could you also share with us your thoughts on the procurement authorities and mechanisms in Pakistan? What kind of a cooperation and information flow is there between SSM and Pakistan's procurement authorities?

**Prof. Dr. İsmail DEMİR:** Pakistan's Ministry of Defence Production, which was established in 1991, is the counterpart of our Undersecretariat. We often come together with officials from this Ministry –which is responsible for production and cooperation in defence and aerospace– on various occasions such as the IDEAS and IDEF (International Defence Industry Exhibition), as well as in periodic cooperation meetings, to evaluate cooperation issues on the agenda and to ensure a flow of information.

To keep the channels of communication constantly open, our Undersecretariat's Department of International Cooperation has established a working group with Pakistan's Ministry of Defence Production and the Office of Pakistan's Military Attaché. The said working group gathers on a regular basis to evaluate the current and potential areas of cooperation between the two countries.



Turkey proposed the MİLGEM platform to meet Pakistan's need for a corvette class ship.

## Cooperation in Land, Sea and Air

**MSI TDR:** Could you give us a brief assessment on the history of the cooperation between Turkey and Pakistan in defence and aerospace, and tell us about your expectations for the future of this cooperation?

**Prof. Dr. İsmail DEMİR:** There are numerous cooperation projects between Turkey and Pakistan that have been successfully completed. Coast guard boats, Fleet Replenishment Tanker, F-16 modernisation, tactical radios, the STAMP and STOP remote controlled weapon systems, various software and simulators, handguns and ammunition are examples of the areas where we have successfully cooperated with Pakistan until now. In addition to these past cooperations, the tender for the modernisation of Agosta 90B class submarines in the inventories of Pakistan Navy was recently won by STM, thanks largely to the extensive efforts of our Undersecretariat. The ASELPOD targeting pod developed by ASELSAN for use in fighter jets has also been exported as a result of similar efforts. The most important indicator of the mutual cooperation between the two countries is that Pakistan's Super Mushshak aircraft was selected within the context of the Primary Trainer Aircraft project that aims to meet the requirement of the Air Force Command. In this project, the decision was taken that both the production and development phases of

the aircraft will be carried out together with TAI (Turkish Aerospace Industries Inc.).

In the near future, we also hope to see the MİLGEM corvette in the inventory of the Pakistan Navy, and the ATAK helicopter in the inventory of Pakistan Army. In addition to air and naval systems, we have also been working on cooperative projects in the field of land vehicles. The brotherly nation of Pakistan is planning to modernise its Al-Khalid tanks, and we have notified our counterparts that we can provide all kinds of support in this area and that our companies, which have gained experience with the ALTAY Project, can easily take part in this modernisation project.

**MSI TDR:** We see that Turkey and Pakistan both have turn-key and indigenous solutions for certain platforms and systems that the other party requires. What are the platforms and systems on which the two countries can cooperate on in the short term? Could you tell us about the ongoing meetings on this subject?

**Prof. Dr. İsmail DEMİR:** We have been exchanging information with Pakistan in nearly every field through our common working group as well as on various occasions. We are continuing to work on enhancing our existing cooperations through projects activities focusing on joint production and joint venture.

**MSI TDR:** One of the developments in this area was the testing the of T129 ATAK helicopter in Pakistan in May. Could you tell us your thoughts about this subject?

**Prof. Dr. İsmail DEMİR:** Like many other countries, Pakistan is also interested in the T129 ATAK helicopter. As you mentioned, one ATAK helicopter was brought to Pakistan for summer tests. Within the context of this intercontinental [activity], which is the first of its kind in the world and in Turkey, tests conducted in three different regions were completed successfully. According to the current schedule, it is planned that the Long Range Anti-Tank Missile System (UMTAS) will be test-fired from the helicopter, at a testing ground where Pakistani officials will be present as observers. The cooperation process regarding the ATAK helicopter is continuing as planned. We hope this process will be completed positively.

**MSI TDR:** How is the progress with the MİLGEM project? Could you inform us about Pakistan's interest in MİLGEM?

**Prof. Dr. İsmail DEMİR:** We proposed the MİLGEM platform to meet Pakistan's need for a corvette class ship. As you know, we have already engaged in successful collaborations with Pakistan in the field of naval projects, such as the Fleet Replenishment Tanker and the submarine modernisation. The export of MİLGEM corvette is another

***FNSS***

**INNOVATIVE AND  
PROGRESSIVE  
SOLUTIONS TO  
SUPPORT YOUR  
MISSION**



[www.fnss.com.tr](http://www.fnss.com.tr)  
[www.fnsssocial.com](http://www.fnsssocial.com)





**There is a Bright Future Ahead**

**MSI TDR:** Like Turkey, Pakistan also finds itself in a challenging region, surrounded by many threats. Pakistan, which has to ensure that its armed forces are always ready for duty, sometimes needs credit mechanisms during defence procurements. In the coming period, will Turkey be able to support Pakistan in this regard? Could you inform us about the latest status of SSM's works in this area?

**Prof. Dr. İsmail DEMİR:** As I also mentioned earlier in connection with MİLGEM project, Turkey is planning to extend a credit to Pakistan for the export of the MİLGEM. A first time implementation of such a practice. There is currently a very busy meeting and correspondence schedule between our Undersecretariat and the Undersecretary of Treasury on this subject. I would like to take this opportunity to express my thanks to my colleagues and the esteemed officials of the Undersecretary of Treasury.

If we can ensure that the credit practice for the MİLGEM project becomes systematic, this will make a very important contribution to increasing the exports of the Turkish defence and aerospace industry. As you may already know, the currently used Eximbank loans cannot, due to international rules, be extended for weapon systems unfortunately. In this respect, we will be able to overcome this problem if the credit system we intend to use in the MİLGEM project can be put into practice effectively. This will also help pave the way for other projects.

important naval project in which the two countries might cooperate. The relevant authorities in both countries have been in close contact on this subject.

There is also a plan to do something within the context of the MİLGEM project which hasn't been done before, which is to extend a loan to Pakistan from the state budget. The MİLGEM corvette will be exported to Pakistan if an agreement can be reached on the technical and budgetary issues during the negotiation process conducted under the coordination of the Department of International Cooperation of SSM.

**MSI TDR:** What is the latest status with Turkey's procurement of the Super Mushshak from Pakistan within the context of the Primary Training Aircraft project?

**Prof. Dr. İsmail DEMİR:** The procurement of Super Mushshaks is one of the most important indications that the cooperation between Turkey and Pakistan is moving forward on both sides. Our goal is to continue the defence and aerospace industry relations between the two countries through cooperations established around a win-win approach. Within the context of the procurement of the Super Mushshak aircraft, the [approval] decision of the Defence Industry Executive Committee has already been signed, and the goal for the upcoming period is to successfully complete the contract negotiations and sign the contract. As always, the two countries will exchange their capabilities during the procurement process, in which TAI will assume an effective and important role.

Turkey would like to benefit from Pakistan's JF-17 fighter experience for the Turkish Fighter Development project.



© MSI TDR



**Designed for the future of the Unmanned Aviation...**  
Unmanned Aerial Vehicle Systems  
**KARAYEL**

**MSI TDR:** Which platform and system might be considered in future for possible joint development and production projects?

**Prof. Dr. İsmail DEMİR:** The cooperation process between Turkey and Pakistan in the field of defence and aerospace has been making steady progress with each passing day. The government officials and company representatives of both countries are continuously working on potential cooperation opportunities. As two brotherly nations, Turkey and Pakistan will continue to cooperate in the field of defence and aerospace, just as they have until now. As I mentioned, this process will move forward in line with the interests of both countries. Direct exports or procurement is not on the agenda of either Turkey or Pakistan. All the projects in which we cooperate emphasise technology transfer, joint production, and on site production.

Pakistan is currently using the JF-17 fighter jets it has developed jointly with China, and holds a considerable amount of experience in this field. In this context, we would like to benefit from Pakistan's experience for the Turkish Fighter Development project.

**MSI TDR:** We see that naval projects have recently become prominent in the defence relations between Turkey and Pakistan. STM has designed Pakistan's Fleet Replenishment Tanker, and ensured, as the prime contractor of the project, that the tanker was built at the Karachi Shipyard. STM has also undertaken the modernisation of Pakistan's Agosta 90B submarines. First of all, we would like to ask you



Turkey selected Pakistan's Super Mushshak aircraft for the Primary Trainer Aircraft project.

© Sergey Ryabov

about the role of SSM in these projects. What kind of contributions has the SSM made during the signature stage of the contracts, as well as in the stages following the signature?

**Prof. Dr. İsmail DEMİR:** The export of defence products and systems cannot be successful without government support. This is the same in almost all countries around the world. When we examine the countries that are the world's top ten exporters, we can see that they all have public institutions specialising on exports. In other words, they have established public institutions that only deal with the export of defence products and systems, and have created various support mechanisms accordingly. In this respect, we, as the Undersecretariat, have been supporting the export activities of our companies by utilising all the instruments we have at our disposal. STM won the tender for the modernisation of Agosta 90B class submarines against the French DCNS company, which is the original equipment manufacturer (OEM) of the said submarine. There is no doubt that the meetings we held with Pakistan's Ministry of Defence Production during the decision phase played a role in this outcome.

**MSI TDR:** What lessons can the industry learn from these achievements of STM? What approach should the companies in the industry adopt when trying to do business in Pakistan?

**Prof. Dr. İsmail DEMİR:** Our defence and aerospace industry relations with Pakistan are quite strong and based on sincerity and trust. For companies wishing to conduct cooperative activities in Pakistan, it is imperative that they first meet with the SSM's Department of International Cooperation. We also have very close relations with Pakistan's Military Attaché Office. All cooperation projects are being successfully conducted in coordination with the Department of International Cooperation of our Undersecretariat.

**MSI TDR:** Mr. Undersecretary, is there anything you would like to add?

**Prof. Dr. İsmail DEMİR:** I would like to thank you for the interview and wish you success in your work.

*On behalf of our readers, we would like to thank Prof. Dr. İsmail Demir, Undersecretary for Defence Industries, for taking the time to answer our questions and for providing us with such valuable information.*

Like many other countries, Pakistan is also interested in the T129 ATAK helicopter.



© MSI TDR

# DCSIM Damage Control Simulator



Lieutenant General (Retd.) Syed Muhammad OWAIS, HI (M), Secretary, Pakistan Ministry of Defence Production:

## “IDEAS serves as a platform to portray a positive and realistic image of Pakistan.”

IDEAS has been the platform which demonstrates the maturity of Pakistan’s defence industry. We talked with Lieutenant General (Retd.) Syed Muhammad Owais, HI (M), Secretary, Pakistan Ministry of Defence Production, about IDEAS 2016 and the future of the exhibition.

*Birol TEKİNCE / btekince@milscint.com*



**Birol TEKİNCE:** Can you briefly introduce Defence Export Promotion Organization (DEPO) to our readers?

**Syed Muhammad OWAIS:** DEPO, established in 2000 under Ministry of Defence Production (MoDP) to provide a platform to public and private sectors for promotion, facilitation and coordination of defence exports. DEPO also conducts defence exhibitions, seminars and conferences connected with defence exports and facilitate participation of both public and private Defence Production Establishments (DPEs) in foreign exhibitions through pro-active marketing strategy.

One of the major roles of DEPO is to conduct International Defence Exhibition & Seminar (IDEAS) at Karachi Expo Centre biennially. IDEAS is a unique pedestal that not only promotes Pakistan image but also puts on display Pakistan’s defence sectors’ potential at an international level. It presents an ideal opportunity to trade visitors for sharing views, developing understanding of the latest developments and technological know-how in the defence industry and exploring innovative and affordable solutions to defence related challenges.

**Birol TEKİNCE:** How do you place IDEAS among other defence fairs or trade shows? What are the regional and global impacts?

**Syed Muhammad OWAIS:** The foremost purpose of IDEAS is to act as a stage for convergence of international and domestic exhibitors, International delegations, defence and security analysts and top level policy planners for creation of new opportunities and promotion of mutual cooperation in the field of defence. It is also an occasion for networking and connectivity of defence industry for joint ventures and media. IDEAS also facilitates us in moving further for achieving our goal, i.e “Arms for Peace” which reflects Pakistan’s principled stand that a more balanced armsequationamongstneighbouring countries acts as an effective deterrent.

The IDEAS has become one of the largest international defence exhibitions in the region. It attracts a large number of exhibitors, defence delegations and trade visitors across the globe. Consequently, it gives ideal forum for our defence manufacturers for entering into collaboration with our international defence partners.

**Birol TEKİNCE:** What are your expectations from IDEAS 2016?

**Syed Muhammad OWAIS:** As large number of exhibitors, trade visitors, defence delegations and top level policy planners have confirmed to participate in IDEAS 2016; therefore, we expect this mega event will prove to be

of immense value and creating favourable environment for defence industry of Pakistan. This will provide us good opportunity for having connectivity and networking with foreign defence industry for joint venture and international and domestic print and electronic media.

In IDEAS 2014, 338 exhibitors and 85 delegations from 67 countries participated and 12 to 15 countries pavilions were established. For IDEAS 2016, preparations and promotional campaign are already underway and we expect even bigger participation from around the globe.

Planned events of IDEAS 2016 are:

- Inauguration Ceremony: Inauguration ceremony will be held on 22th of November. Honourable Prime Minister of Pakistan will be the Chief Guest.
- Seminar: Seminar will be held on the evening of 22th of November at Movenpick Hotel. Theme of the Seminar is “Stability and the Economics of Regional Peace in South Asia.”
- Sideline Conferences: Sideline conference sessions will be arranged offering various



Turkey recently presented 34 T-37 training aircraft to PAF Academy Risalpur.

training packages, equipment and systems by the foreign and domestic exhibitors as well as representatives of Armed Forces to promote their products.

**Biröl TEKİNCE:** How do you assess the Turkish contribution to IDEAS so far and for future? Also, can you inform our readers about defence cooperation between Turkey and Pakistan?

**Syed Muhammad OWAIS:** The Turkish contribution in enhancing the stature of IDEAS is tremendous and praiseworthy. The Turkish defence exhibitors participate in IDEAS in a bigger way and they occupy the largest space in Expo Centre Karachi to display their entire range of defence products. Consequently, the cooperation between two countries has been materialized to the extent that Karachi Shipyard & Engineering Works (KS&EW) and Turkish firm STM jointly built a Fleet Tanker having tonnage of 17,000 tons. The Tanker has recently been launched by Honourable Prime Minister of Pakistan. The Ceremony was also attended by Undersecretary for Defence Industries of Turkey Prof. Dr. İsmail Demir. Moreover, 2 Turkish-origin Multi-Role

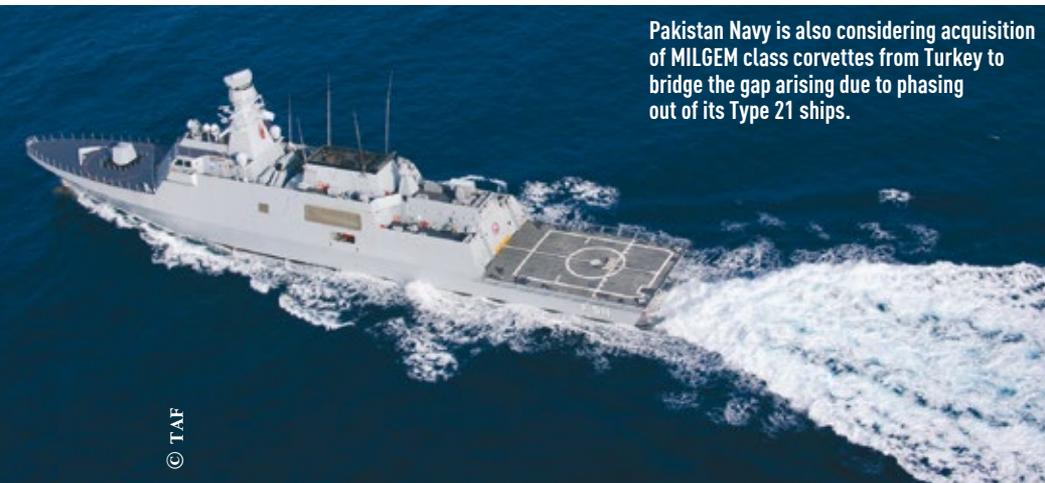
Tactical Platform (MRTP-33) attack craft were inducted into the Pakistan Navy fleet, boosting the Pakistan Navy's capability to defend coastal installations and strengthen its maritime interdiction role especially in the context of a multi-nation coalition force to deal with terrorists at sea.

Moreover, STM from Turkey has won the contract for Mid-Life Upgrade (MLU) of Pakistan Navy's Agosta-90B submarines, although DCNS of France also offered an upgrade solution. Pakistan Navy is also considering acquisition of MİLGEM Class corvettes from Turkey to bridge the gap arising due to phasing out of its Type 21 ships. Recent presentation of 34 T-37 training aircraft of TurAF to PAF Academy Risalpur is also a hallmark and manifestation of mutual cooperation between the two countries. A contract for provision of 52 Super Mushak aircraft to Turkey is underway, which speaks a large volumes of defence exports amongst two brotherly countries. It would not only boost the existing defence collaboration but would also become a symbol of Pakistan-Turkish relationship. Importantly, joint collaboration on 5th generation fighter aircraft, commonly

Pakistan co-developed JF-17 with China and is ready share her fighter-aircraft development experience with Turkey.



known as Turkish Fighter Development (TF-X) Program, will be a true flagship project between Pakistan and Turkey. Currently, the details and scope of collaboration and participation is being worked out between the two governments for jointly undertaking this strategic project, which would further open



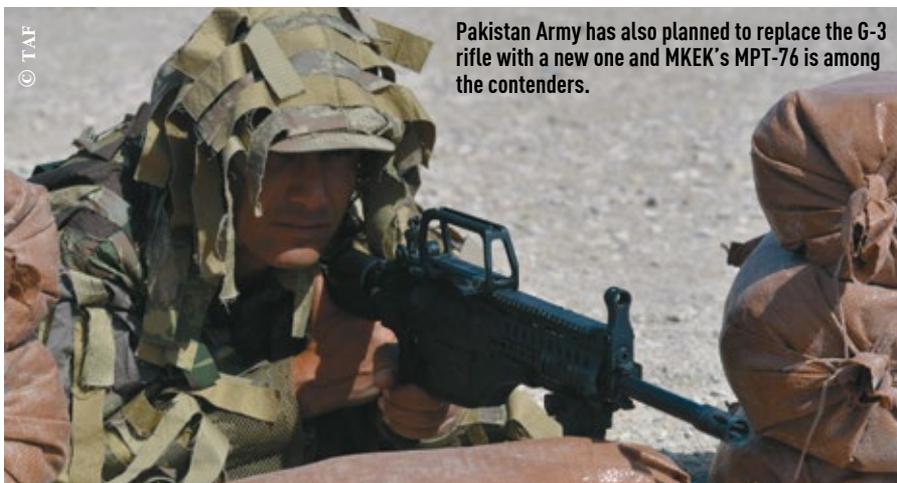
Pakistan Navy is also considering acquisition of MILGEM class corvettes from Turkey to bridge the gap arising due to phasing out of its Type 21 ships.

© TAF

participated; the exhibition has grown to the extent that in IDEAS 2014, 338 exhibitors and 85 delegations from 67 countries participated. In IDEAS 2016 scheduled from 22-25 November, we are receiving very encouraging response from foreign delegations as well as exhibitors and expect even larger participation.

**Birol TEKİNCE:** Do you think that IDEAS has helped the defence sector of Pakistan to showcase their capabilities in true sense?

**Syed Muhammad OWAIS:** There is no second opinion to this claim that IDEAS has played a turned around role to promote defence sector of Pakistan. With the passage of time IDEAS has significantly contributed towards promoting strategic partnership with our friends and has served to achieve the shared objectives of peace and stability in the region. It is one of the finest meeting points of the world's defence industry for demonstrating, selling, better marketing, promoting, joint venturing, outsourcing, signing of MoUs and technical collaboration in the Asian defence market as well as enhancing our mutually beneficial relations with the international community. IDEAS exhibits a wide variety of defence systems, ranging from equipment used in third world countries to the most sophisticated technology from the west and showcases technology of tomorrow and innovations in defence with more than thousands of weapon systems on display.



Pakistan Army has also planned to replace the G-3 rifle with a new one and MKEK's MPT-76 is among the contenders.

© TAF

new vistas of mutual cooperation of defence industries of the two countries. Additionally, significant progress has been made in the evaluation T-129 ATAK helicopter and concerted efforts are underway to conclude the evaluation for its possible induction in the Pakistan Army.

Pakistan Army has also planned to replace the G-3 rifle with a new one. In this regard, MKEK of Turkey is amongst the companies which are participating in the trials being held in Pakistan.

For the upgrade of Pakistan Army's main battle tanks, the Turkish side has been extending full support from ASELSAN and ROKETSAN, to modernise through joint efforts.

proving Pakistan's defence products through collaboration with prospective international partners.

With the passage of time, IDEAS has come a long way and attained the standard of high class defence exhibition. With modest beginning of IDEAS in year 2000, in which, 65 companies

**Significant progress has been made in the evaluation T-129 ATAK helicopter and concerted efforts are underway to conclude the evaluation for its possible induction in the Pakistan Army.**



© TAI

**Birol TEKİNCE:** IDEAS has been growing in each iteration. What are the future goals of IDEAS?

**Syed Muhammad OWAIS:** IDEAS provides opportunities to our defence industry, both public and private sectors, to display its capabilities and interact directly with international community for better marketing, promotion, joint venturing, out-sourcing further im-

Riot Control Vehicle (RCV)



Armoured ADR Fuel Tanker



Riot Control Shield



Armoured ADR Fuel Tanker



Armoured Tipper



THE NEW POWER OF THE TURKISH DEFENCE INDUSTRY

Armoured Low Bed Trailer



Remote Controlled Armoured Tracked Excavator



Armoured Backhoe Loader



KHAN.D 4x4 Armoured Personnel Carrier (APC)



IDEAS 2016 PAKISTAN ARMS FOR PEACE

22-25 NOVEMBER, 2016 KARACHI EXPO CENTRE HALL: 02 - NO: B18 www.ideaspakistan.gov.pk

KATMERCİLER

10032 Sok. No:10 A.O.S.B. 35620 Çiğli / İzmir / TÜRKİYE

+90 232 376 75 75 +90 232 376 75 81

defence@katmerciler.com.tr katmerciler.com.tr



**We Encourage the Industry**

**Birol TEKİNCE:** What role Ministry of Defence Production is playing to strengthen the military exports from Pakistan?

**Syed Muhammad OWAIS:** Besides IDEAS, MoDP also encourages our industry to participate in the international defence exhibitions abroad. Pakistan Pavilion is established under MoDP in Abu Dhabi, France, UK, South Africa, Turkey and Malaysia, whereas, individual DPEs also participate in a few other exhibitions. MoDP promotes public and private sector manufacturers equally. Defence product catalogue, documentary movie, website and now completion of display halls, where a wide range of defence products are being showcased, are a few examples. MoDP also ensures that visiting delegations are networked with DPEs. During visits abroad by Minister or Secretary, brochures and documentary movies in sufficient quantity are taken along for promotional purposes.

**Birol TEKİNCE:** What is the future of defence industry of Pakistan?

**Syed Muhammad OWAIS:** The future of defence industry of Pakistan is very bright. As you know, marketing and sale of defence products is a time-consuming job. It normally takes long time to finalize and deliver a defence-related deal. In Pakistan's case, the sale is government-to-government which usually takes more time in terms of evaluating and finalization. Moreover, supplier-customer relations are also very crucial in this regard. Although we are using the concept of IDEAS for the promotion of defence products but still there is a lot of work to be done. To encourage the private sector in enhancing the defence capabilities and export of Pakistan, DEPO held a seminar on "Public Private Partnership in Defence Production and Export: Challenges and Way Forward" at Islamabad, wherein eminent speakers from Pakistan and abroad participated. They enlightened us that how Pakistan can benefit for private investment in public defence sector for enhancing the defence export, collaboration amongst the friendly countries and to identify, integrate and utilize the industrial potential available in pub-



Al-Zarrar main battle tank

© Wikimedia Commons

lic and private sector for defence production. We really are proud to say that our products like JF-17 Thunder aircraft, main battle tanks Al-Khalid and Al-Zarrar, the Baktar Shikan anti-tank guided missile, Super Mushshak, fast attack craft, UAVs and various ammunitions are indigenously developed and equally being commended by the international community.

**Birol TEKİNCE:** What types of challenges are you facing in achieving your objective?

**Syed Muhammad OWAIS:** In Pakistan, we are progressing gradually as we

Baktar Shikan anti-tank guided missile



© Wikimedia Commons

have tough competition all around us from quality to cost. We plan to achieve desired objectives through vigorous marketing utilizing diplomatic channels and trade visits by participation in international defence exhibitions and also by organizing IDEAS, which is basically the flagship of DEPO. As you know, due to prevailing security environment, the holding of IDEAS and inviting such a large number of foreigners have always been a challenge. The main aim of the IDEAS is to demonstrate capabilities of Pakistan defence industry, alongside international companies. It is pertinent to highlight that large number of foreign delegations as well as exhibitors attended the IDEAS 2014 due to continued marketing efforts. It enables the buyers to compare technology and the cost, so that they can have an assessment of the level the Pakistan industry has reached. IDEAS also serves as a platform to portray a positive and realistic image of Pakistan.

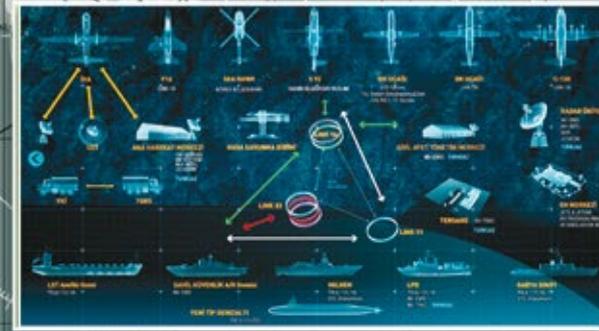
*On behalf of our readers, we would like to thank Lieutenant General (Retd.) Syed Muhammad Owais, HI (M), Secretary, Pakistan Ministry of Defence Production, for taking the time to answer our questions and for providing us with such valuable information.*

- With the contract signed with Sikorsky, MILSOFT became the first Turkish Company having a role in Mission Computer Development Project
- The first Turkish Software used in NATO JWID Exercises belong to MILSOFT
- The first critical software contract awarded to a Turkish Company in the international market belongs to MILSOFT, with Sikorsky S-92 Maintenance Data Computer Software Project.
- MILSOFT became the first company in Turkey who achieved CMM Level 3
- MILSOFT received her first national contract as a Main Contractor for JETS & JETSIM and delivered it successfully before its deadline
- MILSOFT became the first company in Europe and Turkey who achieved CMMI Level 5, and still, MILSOFT is the only company in Turkey who holds this level
- MILSOFT has developed the Image Exploitation Software for the purpose of Image Intelligence which is the main mission of Unmanned Air Vehicles
- MILSOFT has developed Electronic Warfare Programming and Simulation Laboratory to Turkish Navy and again, delivered it ahead of its schedule
- We received our Turkish Navy Project which made us one of the major players in the world in Multi Data Links area
- We received the Technological Success Award with our National Combat Management System based on the latest technology with National Design
- All of the technologies we have developed were successfully used in national and international projects
- Our Coast Guard Search and Rescue Ships are on duty with the first and only nationally designed Combat Management System
- Turkish Navy's Ships are communicating with aircrafts of Turkish Air Force and NATO units with our national system
- More than 2000 Electronic Warfare Officers of Turkish Armed Forces, was trained with our Electronic Warfare Training Simulation system
- Unmanned Air Vehicles are continuing to their main mission: "Image Intelligence" successfully with MILSOFT software

*We made our country one of the leading countries in Europe in terms of "Quality in Software"*



MILSOFT, the first CMMI Level 5 company in Europe and the only one in Turkey, is a Software Development and System Integration Company that develops indigenous and internationally competitive solutions based on the latest technologies.



**Technology Center**

[www.milsoft.com.tr](http://www.milsoft.com.tr)

# We Have Confidence in the Future of the Turkish Defence and Aerospace Industry

As is the case in other countries around the world, the defence and aerospace industry is one of the top strategic industries for Turkey. In recent years, the Turkish defence and aerospace has gained a great momentum with the support of the government, the coordination of the Undersecretariat for Defence Industries (SSM), the interest of the private sector, and the contributions of the Defence and Aerospace Industry Exporters' Association (SSI). Turkey, with its infrastructure and capabilities, as well as its indigenous products and international project partnerships, it ranks among the important actors of the global industry.

The Turkish defence and aerospace industry's performance continues to exhibit an upward trend in both the domestic and international markets. Meanwhile, both the export performance of the industry and the ratio at which Turkey can domestically meet its defence requirements are increasing every year. While our exports were \$884 million in 2011, they have reached \$1.656 billion last year. This year's export target is \$2 billion.

Currently, our industry is able to offer internationally competitive products and develop innovative projects. The Turkish defence and aerospace industry designs and manufactures training aircraft, launches its own warships, conducts various unmanned aerial vehicle projects, and makes an appearance in the international arena with a broad range of products that includes helicopters, missile systems and rifles. These products will undoubtedly move our export performance to even higher levels.

Exports are of critical importance for the continued growth and development of our industry. In this regard, we attach great importance to opening up to the world and becoming integrated with it. The products of the Turkish defence and aerospace industry are used for security purposes over a large geographical area, stretching from North America to Africa, and from Europe to the Middle East. At this point, our biggest objective as SSI is to further diversify Turkey's export routes and start cooperating with new countries. We are



working to enhance our presence over a wider geographical region, and to contribute to the security of a greater number of countries.

Therefore, we attach great importance to the 9th International Defence Exhibition and Seminar (IDEAS). As the association and the industry, we believe that there is significant benefit to be gained by this event that offers the opportunity to establish new business networks and develop new collaborations.

Gathering and representing the exporters of the Turkish defence and aerospace industry under a single roof, we, as SSI, are working to make Turkey one of the important suppliers of the global industry, while also seeking to access to new markets and increase the industry's exports. Promotion is certainly one of the most important aspects of this entire process. Our companies engage in high quality production, design state-of-the-art systems, and execute important projects, and we are working to show and promote these accomplishments worldwide.

We are conducting important activities with the Turkish Defence Alliance (TDA), which we have established and sustained with the aim of ensuring the effective promotion of Turkish defence and aerospace industry around the globe.

Owing to Turkey's potential, skilled labour force and capabilities, the SSI and TDA have full confidence in the future of Turkish defence and aerospace industry. In this industry where we are constantly developing, we will endeavour to become one of the most preferred countries through the products and projects we offer to the global market. Through events such as IDEAS, we believe that we will have the opportunity to demonstrate our strength, share our potential, and establish new cooperations.

I hope that the IDEAS will lead to new starts and breakthroughs for all of us.

## **Latif Aral ALIŞ**

*Chairman of the Board of Directors, Defence and Aerospace Industry Exporters' Association*

*Chairman of the Turkish Defence Alliance*



# YOUR STRONG MEDIA PARTNER

*Since 2004*

Mutlukent Mah. Angora Cad. No: 184/27  
PK. 06810 Beysukent Çankaya / ANKARA  
T. +90 (312) 225 41 73 F. +90 (312) 225 41 74

[www.milscint.com](http://www.milscint.com)





## **TCG BÜYÜKADA (F-512) Visits Pakistan**

The Ada-class (MİLGEM) TCG BÜYÜKADA (F-512) arrived Karachi for goodwill visit between 26-30 of October. During the stay at Karachi, the crew of the ship held

professional interaction with counterparts from Pakistan Navy on the subjects of mutual interest. Turkish Navy officers and personnel also visited various operational and training units of Pakistan Navy and participated in different operational and training activities. Chief of the Naval Staff, Admiral Muhammad Zakauallah also visited TCG BÜYÜKADA.





During the visit, a bilateral naval exercise was conducted between the Turkish and Pakistan Navy at North Arabian Sea with an aim to enhance interoperability and contribute towards regional maritime security. The exercise covered a number of serials including Anti Air Warfare Operations, Communication Drills and Joint Manoeuvres by the

participating surface ships, aircraft and helicopters from both the sides. Deputy Chief of the Naval Staff (Operations), Vice Admiral Zafar Mehmood Abbasi and Commander Pakistan Fleet, Vice Admiral Arif Ullah Hussaini witnessed the exercise on board TCG BÜYÜKADA.



TCG BÜYÜKADA sails along PNS ASLAT



## Ali Fidan Appointed as Undersecretary of the Ministry of National Defence

Pursuant to the decision published in the Official Gazette number 29813 dated August 26, 2016, Ali Fidan, the Governor of Düzce, was appointed as Undersecretary of the Ministry of National Defence. Ali Fidan was born in 1970 in the Gerede District of

Bolu. He completed his elementary and middle school education in Gerede, and his high school education in Bolu in the year 1988. In 1992, he graduated from the Public Administration Department of İstanbul University, Faculty of Political Sciences. For a brief period of time, he worked as a Research Assistant at the Public Administration Department of Abant İzzet Baysal University, Faculty of Economics and Administrative Sciences.

In 1994, he began working as a local authority official and a district governor candidate at the Bolu Governorship. During his internship as a district governor candidate, he received language education for a period of eight months in the United Kingdom. He was later

assigned as Deputy District Governor at the Kurşunlu district of Çankırı, and the Ulubey district of Uşak. Fidan later held the following offices:

- 1997-1999: District Governor of Felahiye District, Kayseri
- 1999-2001: District Governor of Yazıhan District, Malatya
- 2001-2003: Deputy Governor of Malatya
- 2003-2007: Branch Office Director at the General Directorate of Provincial Administration
- 2007-2012: Department Head at the General Directorate Of Provincial Administration
- 2012-2013: Deputy General Director at the General Directorate Of Provincial Administration
- 2013-2015: Branch Office Director at the General Directorate of Provincial Administration

Since March 9, 2015, Fidan has held the office of Governor of Düzce. Fidan is currently continuing his Doctoral studies in the Security Strategies and Management Department of the Turkish National Police Academy, Institute of Security Sciences. Fidan also has postgraduate degrees from İstanbul University and Portsmouth University in the United Kingdom.

On behalf of the MSI Turkish Defence Review, we wish Ali Fidan every success in his new position.

# Ammunition flex chute solutions for land, naval and air platforms



- ◆ Designed and verified per MIL standards
- ◆ Lower driving load due to minimized traction forces
- ◆ Weapon left and right hand side feed option
- ◆ Independent, fully flexible body structure

- ◆ Modular construction, adoptable to any weapon system
- ◆ Aluminum body with stainless feed path structure
- ◆ Always on-time delivery

**FOTONIKS**



Day Optic Weapon Sight



New Generation T.W.S. (CLIP-ON)



Holographic Weapon Sight



Panoramic N.V.G.



N.V. Weapon Scope (CLIP-ON)



Laser Pointer and Illuminator



Fusion Goggle

Fotoniks Military Electronics and Electro-Optics Company  
[www.fotoniks.com.tr](http://www.fotoniks.com.tr)



## STM Cyber Fusion Centre Enters into Service

The concept of a Cyber Fusion Centre that identifies cyber attacks before they even take place is being implemented by STM for the first time in Turkey through its new centre established in Ankara. The STM Cyber Fusion Centre was inaugurated on May 17 with a ceremony attended by Prof. Dr. İsmail Demir, the Undersecretary for Defence Industries. In a press release concerning this inauguration, STM described the concept of cyber fusion as follows: "Cyber fusion is new generation approach in which data from

different sources are combined, analysed with artificial intelligence algorithms, and then processed with a mechanism known as machine learning. Unlike classical cyber security, which mainly focuses on blocking incoming attacks, this multidisciplinary approach involves a proactive concept in which the attack pattern is identified by establishing relationships between all the relevant parameters, thus allowing attacks to be detected beforehand, and enabling the targeted system to be prepared for the attack before it even takes places.

All photographs : © STM



Commenting on this concept, Prof. Dr. Demir said: "Cyber Fusion Centres are found only a few countries around the world, and with the establishment [of this centre], Turkey has gained an important asset with regards to cyber security. In today's world, cyber attacks are among the greatest threats to national security. Analysing and preventing cyber attacks before they take place is of critical importance. Today, an important step has been taken for ensuring this."

Davut Yılmaz, General Manager of STM, described that with the new generation Cyber Fusion Centre, STM has moved beyond classical methods. "Cyber threats are increasing in number, while also undergoing constant changes in terms the methods they employ and detectability. This has rendered effective identification through classical methods almost impossible. For this reason, it is imperative to

become aware of attacks before they happen, and to form automatic defence patterns to address them. In other words, we need to be proactive rather than reactive. The cyber fusion centre we are inaugurating today is a product of this new generation cyber security perspective, and is a ground-breaking institution for our country in many respects. I hope that this multidisciplinary centre, operating with an artificial intelligence mechanism that is entirely of our own making, will be of great benefit for our country," said Yılmaz.

The aim of the Cyber Fusion Centre is to implement a modern cyber security approach that combines vulnerability management, cyber threat intelligence, threat defence operations, cyber operation centre and incident response capabilities with innovative war game methods that enable upper level administrators to take initiative in the management of cyber incidents.



## STM Becoming a World Brand in Submarine Modernisation

STM has been awarded the international tender for the half-life modernisation of Agosta 90B class submarines in the Pakistan Navy inventory. Covering a total of three submarine modernisation orders, one confirmed and two optional, the contract was signed on June 22 in Pakistan between Pakistan's Ministry of Defence Production and STM, in the presence of officials from the Embassy of Pakistan in Turkey and the Undersecretariat for Defence Industries. After a tender process that began on April 16, the ministry found

STM's proposal to be technically and commercially superior. As a result, STM has achieved a major success against the company that had originally designed and built the submarines. It has also achieved a groundbreaking success by carrying out Turkey's first export in the field of submarine modernisation. The modernisation activities will be carried out at a local shipyard in Pakistan, and the first submarine will be delivered in 45 months. The other submarines are expected to be modernised with an interval of one year between them.

## HAVELSAN Hosts Brigadier General El-Ghanim, Qatar's Chief of General Staff

Brigadier General Ghanim bin Shaheen El-Ghanim, Qatar's Chief of General Staff, paid a visit to HAVELSAN as part of his program in Ankara during the month of August. HAVELSAN, which is currently conducting the AW139 Simulator Centre Project for the training of helicopter pilots of the Qatar Air Force, had the opportunity to show Brigadier General El-Ghanim the Full Mission Simulator developed within the scope of this project. In this project, HAVELSAN has already completed the deliveries for the Flight and Navigation Procedures Trainer, the Cabin Team Training Simulator, the Debriefing System and the Tactical Control Centre. The Full Mission Simulator, on the other hand, will be kept at HAVELSAN's Ankara facilities until the completion of the necessary infrastructure in Qatar, and in the meantime Qatari pilots will continue their training at these facilities. During his visit, Brigadier General El-Ghanim met with Qatari



© HAVELSAN

instructors and pilots, and also made a flight on the Full Flight Simulator. After this flight session, Brigadier General El-Ghanim was presented with a flight certificate and brevet to commemorate this flight. Accompanied by Yüksel Öztekin, Chairman of the Board of Directors at HAVELSAN; Taner Düvenci, Deputy Chairman of the Board of Directors at HAVELSAN; and Ahmet Hamdi Atalay, HAVELSAN General Manager and CEO, Brigadier General El-Ghanim inspected the company's Cyber Defence Technologies Centre.



© HAVELSAN



## YOUR SOLUTION PARTNER IN DEFENCE COMMUNICATION SYSTEMS

Karel provides services in all stages from R&D to production for communication solutions specifically for the Defense Industry with ist processes supporting both national and international standards. Karel capabilities:

• Military PABX's • IP, ISDN, Analog communication systems • Intercom systems • Alarm Anons systems for Navy platforms • Command control units • Military type solid state disks (SSD) • Image processing • AHRS, attitude heading reference systems • GPS-INS systems • Special security sensor networks.



[defence@karel.com.tr](mailto:defence@karel.com.tr)  
[www.karel-electronics.com](http://www.karel-electronics.com)

**KAREL**  
Unifying Communications



© European Union

## STM to Take Part in Europe's New Strategic Cyber Security Initiative

On July 5, The European Commission signed an agreement in Strasbourg with the European Cyber Security Organisation (ECSO) for improving the cyber security industry of Europe through strategic research and innovation.

In accordance with the agreement based on a public-private partnership model, the European Union will allocate €450 million to this partnership from the Horizon 2020 programme for research and innovative activities. It is expected that this fund will prompt the private sector

to invest three to four times more, and that by 2020 the total investment will reach €1.8 billion. In these activities, Turkey will be represented by STM, which is among the founding members of ESCO. Noting that taking part in this initiative is an extremely important step, Davut Yilmaz, General Manager of STM, said: "As is well known, in Turkey we have until now completed a large number of significant cyber security projects. We have established the Cyber Fusion Centre against cyber attacks. Now, we will sharing the experience we have gained so far with member countries and the private sector through this Public-Private Partnership Initiative, which will be executed together with the European Commission under the umbrella of the ECSO."

The tender opened by Romania for the modernisation of its Type 22 frigates, which it procured in 2004 and 2005 with dismantled combat systems, was won by a consortium led by STM as prime contractor that also included HAVELSAN, ASELSAN and the Romanian company CRS. A Project Group Cooperation Agreement

## HAVELSAN Provides the Combat Management System of Romanian Frigates

was signed between the consortium members, at a ceremony held on board the TCG HEYBELIADA (F-511) on April 4, during its visit to the Romanian port of Constanta.

In a press release issued by HAVELSAN on July 20, it was reported that the company would provide combat management

systems and carry out the integration of the system within the context of the project. The project will constitute the first export of the combat management system developed by HAVELSAN for the Turkish Naval Forces' surface platforms.



Regele Ferdinand (F-221), Type 22 class frigate of the Romanian Navy

© Ministerul Apararii Nationale

## ARES Shipyard Preparing for Delivery to Qatar

Continuing to work on the construction of 17 composite hull boats in three different models for Qatar's Coast Guard Command, ARES Shipyard has sent the first three boats of this project to Qatar on October 19.

In line with the current schedule, the first boats sent to Qatar included the ARES 75 HERCULES class boats with bow numbers QC 710 and QC 711, and an ARES 110 HERCULES class boat with bow number QC 806. The actual delivery of the boats to the user is planned take place in the next few months.

According to the contract signed during the DIMDEX 2014 exhibition, the project covers the construction of five 24 m ARES 75 HERCULES, ten 34.5 m ARES 110 HERCULES, and two 48 m ARES 150 HERCULES boats by ARES Shipyard.

In the context of this project, the first boat was launched to sea in July. Preparations for the construction of the first ARES 150 class boat have already been completed, and the launch of this boat is expected towards the end of next year.

In accordance with a Memorandum of Understanding signed with ASELSAN, the boats will be equipped with ASELSAN solutions, namely the 30 mm SMASH and the 12.7 mm STAMP. The integration of these weapon systems to the boats is also expected to be completed in short time.

As part of the integration works to be carried out by ARES Shipyard, integration for the first eight boats will be carried out in Qatar, while integration for the remaining nine boats will be carried out in Antalya. Spare parts will also be delivered along with these weapon systems in order to ensure a high level of reliability and maintainability.

Speaking to MSI TDR on the subject, Mert Kalafatoğlu, Chairman of the Board, ARES Shipyard, said that the performances of the ARES 75 HERCULES, which has recently been launched, and of the 110 HERCULES class fast patrol boats have both been higher than required or expected by the project's technical specifications.

Kalafatoğlu also emphasized the shipyard's capabilities: "With its current production infrastructure and technology,

ARES 75 HERCULES



© ARES Shipyard

ARES is by far Europe's largest and the world's second largest composite hull ship builder. ARES employs the most advanced composite ship building techniques, using modern equipment and systems during the construction, as well as the most advanced composite materials. We apply vacuum infusion technology in hull production, ensuring the construction of all hulls with zero errors. Currently, we are operating in the Antalya Free Zone in three production facilities with an indoor area of approximately 18,000 square meters. Soon, we will increase this indoor production area to 25,000 square meters. I can confidently say that we are ahead of the schedule that was set by the customer for both production and delivery. A committee from the Ministry of Interior of Qatar arrived and directly inspected the production phases in our shipyard. This visit and the audit, performed at the level of undersecretary, were concluded very successfully and satisfactorily. In addition, we have started to provide operator and boat level trainings to 425 personnel of Qatar's Coast Guard Command. We have also completed the submission of the technical documentation regarding ARES 75 HERCULES and ARES 110 HERCULES class boats."

ARES 110 HERCULES



© ARES Shipyard

# STM is Heading for the Seas of the World

Over the past 25 years, STM Defence Technologies Engineering and Trade Inc., which was established in 1991 by the decree of the Defence Industry Executive Committee to provide engineering, technical support, project management, technology transfer and logistics support services for the Turkish Armed Forces (TAF) and the Undersecretariat for Defence Industries (SSM), has carried out numerous projects and led the way in many fields. STM, whose mission is to provide project management, system and software engineering, technical and logistics support services as well as developing critical technologies in line with the changing needs of today's world, has become a reputable organisation that is internationally competitive in the fields of technology-based consultancy and engineering solutions. In parallel with the efforts and progress made by Turkey in the naval field especially in the last decade, STM has focused on military ship building and modernisation activities, and now stands as one of Turkey's leading companies in this field. STM has been authorized to improve Turkey's indigenous capability of naval shipbuilding and modernization as well as using the deep-rooted experience of Turkey in order to provide solutions for Turkish Navy and allied & friendly countries, thus provides turn-key engineering services regarding the construction, maintenance and repair activities for military facilities and shipyards.

## The MİLGEM Project: A Turning Point

Through the MİLGEM Ada class corvettes Project a modern surface warship, incorporating all state-of-the-art technological features, is indigenously designed, and with the support of the local industry fully constructed and integrated in Turkey. Within the context of this important project, which has laid the foundations of modern naval industry in Turkey, STM provided ship design services and supplied systems and equipment for the first two ships. Today, these two ships, namely TCG HEYBELİADA (F-511) and TCG BÜYÜKADA (F-512), are successfully operating in seas around the world. For the third

and the fourth ships, whose construction and outfitting are currently underway, STM has assumed additional responsibilities including the supply and integration of the main propulsion system. Furthermore, it has also undertaken significant roles with regards to industrialisation.

The latest status in the MİLGEM project is that 70 percent of the materials, equipment and systems used in the construction and outfitting of the ship have been provided by the Turkish industry. On an item basis, this ratio is around 80 percent. While 212 companies were involved in small scale purchases, main contracts have been signed with a total of 75 private sector companies for the procurement of services and materials, with some 9,200 items of materials being procured in the process. The first two ships, which are on duty in the Naval Forces Command, have successfully completed a number of important domestic and foreign exercises. TCG HEYBELİADA took part in the Barbaros Turkish Naval Mission Group, which toured around the continent of Africa and passed through the Cape of Good Hope after 148 years. During the tour, TCG BÜYÜKADA carried out port visits and conducted operations and training activities in the Gulf of Aden, the Arabian Sea, the Persian Gulf, and the Indian Ocean.

The construction of the third and the fourth ships is continuing as per the contract signed with the SSM on July 24, 2014. BURGAZADA, the third ship, was launched on June 18, 2016, three months ahead of schedule.

Within the scope of the above-mentioned project, STM has continued to structure itself in order to serve as an interface between the local industry and the procuring authorities. Thus, the company has acquired unique experience as well as a specialised key staff that is able to take active part in the industrialisation of military ship building, including submarines, and to guide the industry towards this direction. STM is willing to preserve and improve this special capability that is also recognised and valued at the international arena. Accordingly, it aims to continue recruiting engineers and white collar personnel for ensuring the accumulation and preserva-

tion of knowledge, while also seeking to increase the level of technology it possesses and to increase its share in the world market through international projects. In this context, STM has been officially assigned by SSM with the tasks of managing the export activities of MiLGEM ADA class corvettes and similar platforms including all type of surface combatants , and offering its products and services to abroad as prime contractor. The company is continuing its promotion and business development activities in the international arena.

### Serving Pakistan, A Friendly Nation

In 2013, STM signed with the Pakistan Ministry of Defence Production the contract for the Pakistan Navy Fleet Tanker project, which covers the construction of a single ship to meet the needs of Pakistan Navy.

Within the context of the project, whose prime contractor is STM, the construction of the Pakistan Navy Fleet Tanker is underway at the Karachi Shipyard. STM is responsible for carrying out the following tasks:

- Project management,
- Preparation and delivery of the design package,
- Acquisition of systems, materials and equipment,
- Integrated Logistics Services (ILS),
- Tests and trials,
- Trainings for shipyard personnel and users, and
- Consultancy services.

This project, which is conducted jointly with Pakistan, is the first of its kind between Turkey and the friendly and brother nation of Pakistan in the field of military ship building. Following the successful construction of Pakistan's Navy Fleet Tanker, its launch ceremony was – in line with the project schedule – held in Pakistan on August 19, 2016 with the attendance of Nawaz Sharif, Prime Minister of Pakistan, and Prof. Dr. İsmail Demir, the Undersecretary for Defence Industries.

Following the launch of the ship, the processes of outfitting and commissioning of the systems will be completed. Then, once the tests and trials to be performed at port and in the sea are completed, the ship is planned to be delivered to Pakistan Naval Forces in 2017.

### It's Now the Turn for Submarines

STM has successfully completed the AY Class Submarine Equipment/System Modernisation Project in Turkey, and also contributed to procurement and design activities of the New Type Submarine Project that covers the building at the Gölcük Shipyard Command of six submarines equipped with air-independent propulsion systems. STM is also carrying out works to renovate the infrastructure of the Gölcük Shipyard and to control local participation activities. Furthermore, the company has also started to display its capabilities relating to submarines in the international arena.



The New Type Submarine Project

In this context, the cooperation that started with the Pakistan Navy Fleet Tanker project between Turkey and Pakistan, the two friendly and brother nations, in the field of military ship building and modernisation activities improved further and gained a whole new dimension when STM was selected as the prime contractor of the modernisation project for AGOSTA 90B class submarines designed by the French DCNS shipyard. In the context of the project, STM competed with the French DCNS shipyard, the designer of the submarine, and STM's proposal was found to be technically and commercially superior by the Pakistan Ministry of Defence Production.

The contract regarding the modernisation of a single submarine at the 'PN Dockyard' owned by the Pakistan Navy was signed between the Pakistan Ministry of Defence Production and STM in Rawalpindi, Pakistan on June 22, 2016. STM is responsible for the design package, materials, equipment, ILS, spare parts, tests and trials, and the training of shipyard personnel and users. The project also covers as an option the modernisation of two more submarines. While the modernisation of the first vessel will take 44 months, the modernisation of the other submarines are planned to take place at one year intervals from each other.

In the context of the modernisation activity; the sonar suite, periscope systems, command and control system, radar and electronic support systems will all be replaced, and the current weapons configuration will be integrated with the new systems to be installed. Certain systems designed by HAVELSAN and ASELSAN will also be used in the project.

The Pakistan Navy Fleet Tanker Project



### Long Term Cooperation

The Pakistan Navy Fleet Tanker project, which represents a first between the friendly and brother nations of Pakistan and Turkey, in the field of military ship building, as well as the project on the modernisation of the AGOSTA 90B submarines, are significant indigenous projects that can serve as models in the fields of defence and shipbuilding. It is believed that they will lead the way for similar joint defence projects to be conducted in the near future. STM is very honored to take part in projects that will contribute to further strengthening in terms of platforms the Pakistan Navy, which has a very well trained and experienced team of experts.

In addition to the abovementioned projects, STM has also submitted to Pakistan Naval Forces a proposal, based on the MiLGEM corvette, to meet the Pakistan Navy's need for four corvettes. Furthermore, works relating to the project on the Design and Construction of Midget Class Submarines for the Pakistan Navy are also underway.

As STM, we will continue to work with our dynamic and experienced staff specialised in their respective areas to meet the requirements of the Pakistan Navy in the best way we can.

# T129 ATAK at the Himalayas

Arriving at Turkey in September 2014 to evaluate the T129 ATAK helicopter, the Pakistan Test and Assessment Team had left with very favourable impressions regarding the helicopter following its flight and firing tests. The team members had a single question left in their mind. T129 exhibited a rather impressive performance under the conditions in Turkey. Yet, Pakistan is a rough territory, where all four seasons are experienced under the harshest conditions. All helicopters that have been tested and are currently in use in the country have failed under its challenging geographical and climatic conditions.

The current inventory of the Pakistan Armed Forces thus imposed certain constraints on its operational capabilities. The Pakistan Armed Forces was looking for an attack helicopter that can be active in all seasons and at any hour of the day. Undoubtedly, the successful performance displayed in Turkey was an important data; but the inadequate performance in the past of competing helicopters under Pakistan's conditions compelled the Pakistani party to closely scrutinise their options.

After the tests carried out in Turkey, the next step, according to the road map agreed upon under the coordination of Undersecretariat for Defence Industries, was to test T129 ATAK in Pakistan.

Through an intense dialogue, necessary coordination and preliminary preparations concerning the content and scope of the tests to be carried out in Pakistan were completed. All performance criteria requested by Pakistan's Army Aviation Command was to be tested in Pakistan between May 21-31, 2016.

On May 21, 2016, TAI's Akinci premises was hosting a familiar face. The fellow companion of the T129 ATAK in its international ventures, the IL-76 cargo aircraft, would once again carry the T129 ATAK, to a place where its would be tasked with achieving what has never been achieved before. The said task had remained 'unachievable' at international, and even global scale. Locations which no other attack helicopter had ever reached were now waiting for the T129 ATAK.

The entire TAI team was thrilled with the excitement at this challenging task. With the conclusions of months of preparations, and the coordination of all activities in Turkey and Pakistan, the T129 ATAK was finally loaded onto the cargo aircraft. It was now the T129 ATAK's turn to speak...

Completing its high-temperature tests at 50° Celsius at Pano Aqil, and its high altitude tests at 14,000 feet at the Hindu Kush Mountain range, the starting point of the Himalayas, under the rough climatic and geographical conditions of Pakistan, T129 ATAK Attack and Tactical Reconnaissance Helicopter accomplished what no other attack helicopter in the world has ever achieved, or even attempted to achieve.



The visit of the Pakistan Test and Assessment Team to TAI (September 2014)

## A 'Warm' Reception in Pakistan... at 47° Celsius

On May 22, 2016 the TAI team and the T129 ATAK, arrived at the Army Aviation Command premises in Multan, Pakistan. As in all the other instances where its was sent on international missions and demonstrations, the transport of T129 ATAK was completed under the astonished and admiring gazes of customs officers. However, in addition to this astonishment and admiration, another emotion was also voiced at the Pakistani customs checkpoint: Pakistani citizens said that they took pride in the T129 ATAK developed by Turkey, a country they consider as a friendly and brother nation. It was around 6:00 p.m. The temperature was 47° Celsius...



**Maj. Gen. Samrez Salik, VCGS-B (Vice Chief General Staff-B) of the Pakistan Army, visited the TAI team.**



Pakistan was receiving T129 ATAK with a 'very warm' welcome. Following a short rest after T129 ATAK was placed in its hangar, the operations team started to work at 3:30 a.m. at dawn, so as not to be affected by the heat, and made the T129 ATAK ready for operation in a short period of time. T129 ATAK was ready for its initial tests.

When the helicopter was brought to the field for its first test, it was already 9:30 a.m. The fact that the helicopters in the inventory of Pakistan's Army Aviation Command cannot operate under high temperature was evident in its rules and practices. During summer, no helicopters were allowed to take off from the field after 10:00 a.m. Helicopters returning from training flights that started at early morning hours were landing one after another, shutting down their engines and getting docked. At 10:00 a.m., the only sound on the field was that of the T129 ATAK's engines.

Seconds before the take off, an interesting conversation was heard on the radio between the Multan Army Aviation Command tower controller and Multan International Airport traffic tower:

- Good luck! Is this your new helicopter?
- Thank you. Insha'Allah.
- What is your tail number?
- I don't know... Turks call it T129.
- We wish a safe flight to T129.

Initially, there was a heavy cloud of dust – a product of Pakistan's territory and climate. As the noise became louder, the dust got thicker and thicker. Once the T129 took off, rising clouds of dust, all other helicopters on the field were – in a manner of speaking – standing in silence and respect, watching the new helicopter with great interest. The temperature was 47° Celsius...

In a stroke, the arrival of T129 ATAK at Pakistan became the most popular military topic in the country. High ranking commanding officers and officers of the general staff were arriving to Multan one by one, receiving detailed briefings on the helicopter from the Multan Army Aviation Regiment Commander, who, by then, had become closely familiar with the T129 ATAK. Officers who had arrived from all over Pakistan were observing the flights carried out with T129 ATAK, and expressing their admiration without exception. During all these flights, one of emotions strongly felt by the Pakistani officers was, once again, the sense of 'being proud.'

But after completing its mission in Multan, the part of the demonstration that the T129 ATAK 'likes' most was just about to begin. A route comprising rough climatic and geographical conditions was waiting for the T129. It first had to



**Lt. Gen. Ishfaq Nadeem, Commander, 2nd Corps of the Pakistan Army, before flying with the T129 ATAK.**

overcome the high temperatures of Pano Aqil province in Pakistan's Chor region, and then the high altitudes along the Pakistan-Afghanistan border at the Hindu Kush Mountains, the starting point of the Himalayas.

### **An Even Higher Temperature: 50° Celsius**

On May 26, the T129 ATAK took off from Multan along with a Mi-17 helicopter carrying nine TAI personnel to go to Pano Aqil province, which was having its hottest days of the year. When it arrived at Pano Aqil, the temperature was 50° Celsius. At these temperatures where even mobile phones and cameras hardly functioned, and even shut down completely, T129 ATAK completed all of its tests successfully without breaking a sweat.

A scene witnessed at the office where the evaluation meeting was held after the helicopter landed simply showed how intense the temperature was on that day: Even lizards, one of the most heat-loving creatures on the planet, were lying down in front of the air conditioner, trying survive. Meanwhile, the T129 ATAK was getting prepared for its new mission.

**Landing on the sand under 50° Celsius in Pano Aqil.**



### **Three Days on Field, and an Unexpected Sandstorm**

When all preparations were made to return to Multan, the team received bad news from the meteorology station about the weather. A strong sandstorm had started in Multan, and the city was closed to all civilian and military flights. Officers of Pakistan Army Aviation Command made another plan under these circumstances. To start its new mission the next day, the T129 ATAK was docked to its new hangar, the temperature of which would not be below 48° Celsius all night long. The unexpected shift in schedule had left T129, away from its home base with no spare parts or equipment.



### T129 ATAK at the Roof of the World: the Himalayas...

Getting into action with the first lights of the morning at the relatively cooler (!) temperature of 45°, the TAI team moved the T129 ATAK out to the field for its new mission. Multan was still under the effect of the sandstorm, and the destination was Quetta province at the foothills of the Himalayas. Until then, no attack helicopter had ever passed the high-altitude test at the Himalayas. But neither the outlook of the region or the altitude were intimidating for the T129 ATAK and the TAI team. Executing its mission out and away from Multan, their home base in Pakistan, under difficult field conditions, the TAI team did not lose even a little bit of its commitment and self-confidence. The mission, and the responsibility it brought was enormous, and it was crucial that everything was done properly.

Even though the 14,000 ft. altitude and 23° temperature of the region where the flight will be carried out was within the performance range of T129 ATAK, such conditions are encountered very rarely on Earth. The T129 ATAK was leaving its wheel marks on the roughest terrains of Earth, areas that were once marked by the footsteps of its ancestors.

Meanwhile, the sandstorm was continuing unabatedly in Multan. The helicopter and the TAI team could not return, and they had to spend another night in Quetta. The TAI team spent the night with the peace of mind they felt for having passed their most critical tests. For the time being, all eyes were on meteorology reports...

### Another 'Unachievable' Feat is Added to the ATAK's Résumé

Bursting onto the field rapidly as soon as they received the good news about the weather the next day, the TAI team completed all preparations for take off and started the engines. At a point when even the wedges in front of the T129 ATAK's wheels were removed, a demand of the Pakistani authorities changed the whole operation. According to the initial plan, the helicopter was to be refuelled at a location between Quetta and Multan. The new request, however, required the T129 ATAK to accomplish another 'unachievable' mission: flying directly from Quetta at the Afghan border to Multan without any refuelling.



The TAI and Pakistani Teams during Mission Planning

Calculations were re-made; it was a race against time. According to the new plan, the helicopter should travel around 480 kilometres, and yet the sandstorm in Multan was no joke. The journey had to start while the weather was still clear, before the meteorology station delivered bad news again. T129 ATAK spent the last two nights at locations its team did not know at all, without any spare parts and equipment, and its routine maintenance was approaching.

Owing to the outstanding performance of T129 ATAK and the skills of TAI pilots, the TAI team delivered the good news to Ankara 2 hours 40 minutes after the take off. Besides, T129 ATAK still had enough fuel for 33 minutes of flight after landing. While the Pakistani party was happy about the result, TAI was trying to make sense of the situation. Another



TAI team stuck in the field due to sandstorm – Memories from the Afghan border



piece of information received by the team soon revealed the reason of this joy: Multan was witnessing a crucial moment, as no other attack helicopter had ever managed to fly such distance under these circumstances before. Even without notice, T129 ATAK added another record to its operational history, one that was previously considered 'unachievable.' The most significant and challenging stages of tests were already over; the TAI team and the first Turkish T129 prototype P6 came out from this challenging task with great success. The pride of the TAI team, and their sense of satisfaction they felt for accomplishing this task, completely erased the exhaustion and troubles they experienced on field over the last three days. Having successfully completing its final tests at the Multan Army Aviation Command that involved night flights, the T129 ATAK was waiting to return home, to Turkey, with the contentment of having accomplished its task. Once again, it met with the cargo aircraft that had been waiting for T129 ATAK for days at the Multan International Airport, bidding farewell as it left for the TAI's premises, ready to embark on its next international venture...

*This article was first published in the 101th (June 2016) issue of TAI'nin Sesi (Turkish edition of TAI's Voice magazine).*

## Improvement Through Collaboration

- Product Development
- System Engineering
- Project/Program Management
- Engineering Management
- Process Development
- Configuration Management based on CMII
- Supportability Engineering and ILSP



## A Special Ship with a Special Crew

In the field of defence, the challenging MİLGEM project has been one of Turkey's greatest accomplishments. As a result of its frequent coverage in the media, many details of this project are being closely followed by the public. MSI Turkish Defence Review visited the first ship of the project, TCG HEYBELİADA (F-511), and learned about some lesser-known aspects of the project and the story of the ship.

*K. Burak CODUR / b.codur@milscint.com  
Biral TEKİNCE / btekince@milscint.com  
Vehbi TUNCA / v.tunca@milscint.com*



**O**ur visit to TCG HEYBELİADA took place in January, when it was anchored at the Istanbul Shipyard Command's facilities. While we were there, Lieutenant Commander Engin AĞMIŞ, Commanding Officer; Lieutenant Commander Sinan ÇAKIR, Chief Engineer and Staff Lieutenant Commander Ertuğrul AKTAN, Combat Operations Officer, kindly spared their time to answer our questions. Anyone who is familiar with Turkish Naval Forces Command (TNFC) would not be surprised to learn that the crew of TCG HEYBELİADA was very proud of their ship and had complete trust in it. Moreover, since Lieutenant Commander AĞMIŞ is the first Combat Operations Officer and the former Executive Officer of the ship, and since Lieutenant Commander ÇAKIR has been working on the MİLGEM project almost since the beginning, our conversation turned out to be very rewarding.

### The Fastest Student to Graduate

With the initiation of the MİLGEM project, TNFC has played a key role in the development of a modern and unique military naval industry, designing both the platform and sub-systems, and then collaborating with the Undersecretariat for Defence Industries (SSM) in planning and industrialisation. From this perspective, although MİLGEM is considered to be a start-up and study project, the issue becomes serious when it comes to operational use. MİLGEM is no longer a study project; since the first day it has been required to be a platform that offers the highest performance.

### Brief History of TCG HEYBELİADA

The MİLGEM project, which was first adopted as a concept in 1993, was finally initiated as a result of a decision taken by the Defence Industry Executive Committee (SSIK) on May 14, 2004. The construction of TCG HEYBELİADA, the first ship for the project, began on January 22, 2007, when it was placed in the cradle. The construction of TCG HEYBELİADA, which was undertaken by the Istanbul Shipyard Command, was completed in approximately 160,000 man-days with a total of some 11,000 technical drawings and paperwork. For the construction of TCG HEYBELİADA, which was completed using approximately 1,000 tonnes of shipbuilding steel, some 10 km of pipework, 240 km of cables and 10,000 items of equipment, indigenous solutions were utilised in technological and military critical systems to a maximum level, by the signing of contracts with local companies for a total of 74 different systems, items of equipment and services. Accordingly, local industry participation rate of 65 percent was accomplished with regard to project costs. The ship was launched on September 27, 2008. In line with production and integration activities, port acceptance tests and cruising trials commenced. TCG HEYBELİADA conducted its first navigation on November 2, 2010 in the Sea of Marmara with intensive tests that lasted for some 800 hours, and finally entered into service on September 27, 2011, which also happens to be the anniversary of the naval Battle of Preveza and Turkish Naval Forces Day. On the same day, TCG BÜYÜKADA (F-512), the second ship of the project, was launched.



Therefore, although during the early phases of the project TCG HEYBELİADA was described as a 'prototype ship', due to its maturity and performance, this description has been very quickly forgotten. Entered into service on September 27, 2011, even the missions undertaken by TCG HEYBELİADA between 2013 and 2015, are proof of this:

- The ship visited ports in North Africa and Albania in 2013.
- Within the scope of the activation conducted by Barbaros Turkish Maritime Task Group in 2014, by travelling a distance of 17,000 nautical miles all around the continent of Africa, over a period of three months, TCG HEYBELİADA visited a total of 17 ports in 16 countries, 12 of which were for the first time in the history of the TNFC. In addition, during the comprehensive offshore training conducted in South Africa, under ocean conditions, the shooting of unmanned surface and air targets was very successful. Approaching the territories around the Gulf of Aden and Somali, in coordination with the other task groups in the region, it also participated in operations conducted against piracy.
- On two occasions TCG HEYBELİADA participated in UNIFIL Operations, which were conducted in order to prevent smuggling of weapons and equipment that are forbidden in accordance with United Nations Security Council resolutions 1701 (2006) and 1832 (2008) to Lebanon's territorial waters and ports.
- Furthermore, it took part in the Operation Black Sea Harmony conducted by Turkey in order to provide deterrence against potential illegal activities and to contribute towards the security of the Turkish Straits.
- Due to its command/control means and capabilities, TCG HEYBELİADA also successfully carried out the tasks of a Command Ship in some of the national exercises in which it participated.



Plaques about the accomplishments of the ship and of the exercises being participated, started to cover the walls of TCG HEYBELİADA (F-511).

The first of its class, TCG HEYBELİADA has made and is continuing to make significant contributions to the development of the MILGEM project.

Technical Specifications of MILGEM Class Ships	
Overall Length	99.5 m
Length at Waterline	90.4 m
Maximum Width	14.4 m
Draft	3.9 m
Displacement	2,300 tons
Maximum Speed	29+ knots
Economic Speed	15 knots
Cruising Range	3,500 nautical miles (at economic speed)
Main Propulsion System	CODAG (2 x diesel main engine, 1 x gas turbine) 2 x pitch controlled propeller
Diesel - Generator	400V AC 60 Hz (4 x 588 KW)
Crew	Approximately 95 personnel (including officers, non-commissioned officers, specialised sergeants, and privates) (The ship incorporates accommodation space for 106 people, including flight and flight support personnel, as well as two beds in its infirmary.)
Helicopter	S-70B SEAHAWK (For antisubmarine warfare, electronic warfare and surface warfare tasks)
Operational Capability	The ship has operational capability at sea state five and has partial operational capability at sea state six. It can perform its tasks for ten days without any logistic support. The ship, which has a 44 tonnes freshwater tank, can produce 20 tonnes of fresh water per day.



© TNFC



Bridge of the ship provides a comfortable working environment with its modern design.

### More Duties with a Smaller Crew

Modern naval ships are noteworthy due to the small crew size. Highly automated sub-systems are among the major reasons for the reduction in the number of personnel. For example, while the previous generation of frigates required a crew of 170 to 180, in today's frigates, the displacements of which are 1.5 to 2 times that of previous generations, the number is around 120 to 130.

The decrease in the size of the crew highlights two specific points about the qualifications of the crew:

- The increasing complexity of the sub-systems and an increase in automation requires that all the personnel of TCG HEYBELİADA are specialised in their fields.
- Ideally, each task should be assigned to one particular personnel, however, due to the decrease in the number of personnel, each are required to carry out various other tasks when necessary. This becomes critically important, particularly in the case of an emergency. For example, when the ship is damaged, no matter what their regular responsibility, the relevant personnel should be transformed into a damage control team.

Universally known as 'lean manning', 'hybrid personnel' or 'cross-functional crew', undertaking tasks with a smaller number of personnel is a new concept for the TNFC, as well as for international naval forces. Achieving equilibrium, in terms of the number of crew, can only be achieved as a result of operational practice. It is clear that across the world there are cases where significant changes have been made to crew numbers. In the case of TNFC, the experiences gained, principally through tasks conducted with the TCG HEYBELİADA, have been evaluated and the relevant implications, noted.

Another distinctive approach taken by the TNFC concerning the crew of TCG HEYBELİADA is that the division supervisor and more senior personnel aren't replaced after the ship enters into service. The existing crew are promoted to higher positions and new personnel replace them. As a result of this practice, Lieutenant Commander AĞMIŞ, the current Commanding Officer of TCG HEYBELİADA, is the first Combat Op-

erations Officer and the former Executive Officer of the ship. Thus, even if there is a smaller crew on board, it is ensured that this crew comprises of those most familiar with the ship and that adaptation by newcomers is achieved more easily.

Considering it as a project, the process regarding the formation of TCG HEYBELİADA's crew started back in 2009 when the core staff assigned to the Design Project Office were at the disposal of the İstanbul Shipyard Command and in May 2010 when appointments to support this core staff were made.

### More than a Corvette

Once much clearer, the distinction between ship classes is now becoming more complicated due to technological developments and operational requirements. For example, a ship classified as an 'air defence frigate' can be almost the same size and definition as a destroyer. Although there is no doubt that TCG HEYBELİADA is a 'corvette', it is a fact that the ship encompasses much more than that.

Being recently designed to meet the requirements of Turkish Naval Forces, one of the world's leading navies, and the leading edge technologies it incorporates make TCG HEYBELİADA distinct and superior. Thus, in terms of structural design, which cannot be subsequently modified, it meets contemporary requirements at the maximum level. Among its main prominent features are the design of its mast and its outer form, which reduces radar signature. Due to the location of the 3D surveillance radar, which is the main sensor of TCG HEYBELİADA, and other design features, the ship is capable of using the guns and sensors in the most efficient manner.

As TCG HEYBELİADA is carrying out frigate tasks under the title of corvette class, and that the know-how gained from the MİLGEM concept and the lessons learned during that process support for the development of new platforms with advanced technology. With this objective in mind, by extending the length of ADA class corvettes and increasing its capabilities, the 'İ Class Frigate Project' has been initiated.



**Sub-Systems: Full Integration**

ADA (MİLGEM) class corvettes have been designed so as to be equipped with the best systems of their kind, especially in terms of sensors and weapon systems. Throughout this process, the Turkish defence industry has also undertaken important roles:

- **SMART-S 3D Surveillance Radar:** SMART-S 3D radar designed by Thales constitutes one of the main sensors of TCG HEYBELİADA. The transceiver units for these radars, which are in use at TNFC, are manufactured by ASELSAN. The crewmembers with whom we spoke during our visit, mentioned their satisfaction with the performance of the radar.
- **YAKAMOS Sonar:** Developed by the Turkish Naval Research Centre Command (ARMERKOM) and TÜBİTAK (The Scientific and Technological Research Council of Turkey), the ship's underwater ear is the YAKAMOS sonar; the wet-end of which was industrialised, for the ships that followed, by METEKSAN. TNFC defined the minimum performance requirement for this sonar to be the same as that of the foreign origin sonars in its inventory. Not only did the YAKAMOS sonar equal these performance requirements, in some aspects it even exceeds them. As it is a newly designed system, YAKAMOS offers the advantage of a user-friendly interface in compliance with contemporary norms.

- **GENESIS:** On TCG HEYBELİADA, the GENESIS combat management system, which enables the harmonious operation of sensors and weapons and is the best of its class, was first developed by ARMERKOM and then industrialised by HAVELSAN. GENESIS, which proved itself in GABYA class frigates, demonstrates its other features, which are scalability and the capability of operating with different sensors and weapon systems on MİLGEM. GENESIS does not only enables MİLGEM to participate in combat as an integrated system, but also enables the development of plans regarding the future of its class, by taking all alternatives into consideration. This is because it is well known that when a different sensor and weapon system is on the agenda, it will be possible to integrate them to other sub-systems of the ship through GENESIS. The TCG HEYBELİADA crew expressed their satisfaction with the product support they receive for GENESIS. They said that HAVELSAN provides all kinds of support very promptly and when needed, any changes given final approval through ARMERKOM, could be replicated in the system by satellite.

Console of EPKİS



### Crew Benefits at the Highest Level

The design and layout of the accommodation space in ADA class corvettes is to NATO and Turkish standards.

The same materials were used in all the living quarters, including the cabin of the Commanding Officer and the crew's living quarters. The main features of the living quarters are listed below:

- There are different lounges for officers, chief sergeants, non-commissioned officers and specialised sergeants/soldiers. While cruising and in port, the crew spend their rest times in these lounges where they have the opportunity to watch TV through satellite TV tracking system.
- While cruising and in port, three meals a day are prepared in the galley and served as buffets. Members of the crew have their meals served in their allocated lounges. All crew are served the same food.
- There is a gym area that includes treadmills, exercise bikes, exercise benches, weights, and basketball hoops and the crew can use this area while cruising and in port.
- The crew are provided with constant communication with their families and loved ones, especially during long-term cruises. Using the ship's satellite communication, the crew have a facility for immediate communication with their families, wherever they are in the world.



### ■ Integrated Platform Management System (EPKİS):

EPKİS, which is one of the leading systems allowing ADA class corvettes to operate with a much smaller crew, is integrated with almost all of the ship's systems, such as propulsion, power, damage control, stabilisation, and fire detection; the only exception are the sensors and weapon systems. The system collects data from some 6,000 points across the ship. Prior to systems like EPKİS, crews were required to observe and manage each sub-system separately. Now, EPKİS offers the capability of monitoring and controlling these systems from a single point. Furthermore, it provides the necessary warnings in situations like exceeding the limit values of various parameters. EPKİS display screens are also accessible by authorised users using laptops, which are able to connect to the on-board intranet. Lieutenant Commander ÇAKIR, Chief Engineer, says that it's routine for him to check the EPKİS control screen from his laptop after work, before his resting time. He adds, "If I don't take a look at EPKİS, I feel somehow incomplete. When I first came from my previous ship, I didn't imagine for a moment that I would embrace EPKİS technology this much." One of the many impressive features of EPKİS is the camera network that is installed all over the ship, except for spaces involving privacy. Each camera has a level of mobility and has zooming capability. Therefore, even if there is no crew in a particular station, it is possible to get a reading from an indicator.

STAMP 12.7 mm remote controlled, stabilized machine gun system.



76 mm gun performs anti-aircraft mission.





Launcher of the torpedo defence system.



ASW torpedoes are housed in the helicopter hangar of the ship.

- **Electro-Optical Director:** On the rear mast of the ship, there is an Electro-Optical Director produced by ASELSAN. The TCG HEYBELİADA crew testify that this system is very useful for the detection and identification of surface and air targets. In addition, this system is also used to observe the target during surface and land bombing.
- **ARES-2N Electronic Warfare System:** ARES-2N developed by ASELSAN is used for the detection and identification of electromagnetic emissions.
- **STAMP:** ASELSAN STAMP remotely operated systems, located on both sides of the ship, provide close range defence for the ship and can also be used in emergency situations for homing the bow gun on the target.
- **76 mm Bow Gun:** The Oto Melara 76 mm gun on the ship is a popular weapon system amongst the world's navies. The New Generation Fire Control System (TAKS), which allows the precise homing of the gun to its target, was also developed by ARMERKOM and industrialised by ASELSAN. The crew of the TCG HEYBELİADA confirmed that with the help of TAKS they are able to hit targets up to the maximum range of the gun.
- **Harpoon:** Against surface targets, the best card of the ADA class corvettes is the Boeing made Harpoon missile. The Block II version of these missiles also enables the ship to strike land targets.

- **RAM:** The RAM system is responsible for ships' air defence. The crew of TCG HEYBELİADA appreciates that the RAM system never malfunctions and emphasises its high level of reliability. During the offshore tests conducted in South Africa, using the RAM system, TCG HEYBELİADA successfully eliminated an unmanned air target, which attacked the ship by simulating a guided missile.



RAM is the primary air defence weapon of the ADA-class corvettes.



© TNRC

■ **Power Pack:** Another distinctive specification of the MİLGEM design is the power pack. There are two diesel engines, one gas turbine, and a cross connection gear that transmits the power they generate to two propellers. Due to the nature of the cross connection gear, any diesel engine or the gas turbine can transmit power to both propellers. Thus, with a single diesel engine, the ship can reach speeds of 14 knots. While it can reach a speed of 20 knots with both diesel engines, it can reach a speed of 25 knots using only the gas turbine. A speed of 29 knots can be reached with both the gas turbine and the diesel engines.



© TNFC

In addition to the low level of its underwater acoustic signature, TCG HEYBELİADA is also noteworthy due to its low radio and infrared signatures. The low signature in the radio frequency is achieved by the structural design of the ship. The infrared signature is reduced by repositioning of the ship in accordance with the data provided by various heat sensors on board the ship. The low level of the underwater acoustic signature is achieved by isolating the noise sources on board the ship and by the design of the propeller. Sub-systems of the ship include a 'degaussing' system, which by minimising the magnetic signature provides protec-

tion against moored mines, as well as deep magnetic mines. TCG HEYBELİADA, as the first ship of its class, has hosted many delegations and is continuing to do so. On behalf of our readers, we would like to express our thanks to Lieutenant Commander AĞMIŞ, Commanding Officer of TCG HEYBELİADA, and his crew, who accommodated us as members of the press.

*This article was first published in the April 2016 issue of MSI TDR. The posts of the mentioned ship crew may have changed since the publication.*

## We are manufacturing;

- Electrical wire harness assemblies,
- Electromechanical assemblies,
- Mechanical assemblies,

for air, land, naval, space, telecommunication and defence systems.



**TTAF SAVUNMA**  
Design is our expertise

**"We are not just doing our job well, we are doing good job..."**

Today Tomorrow And Forever

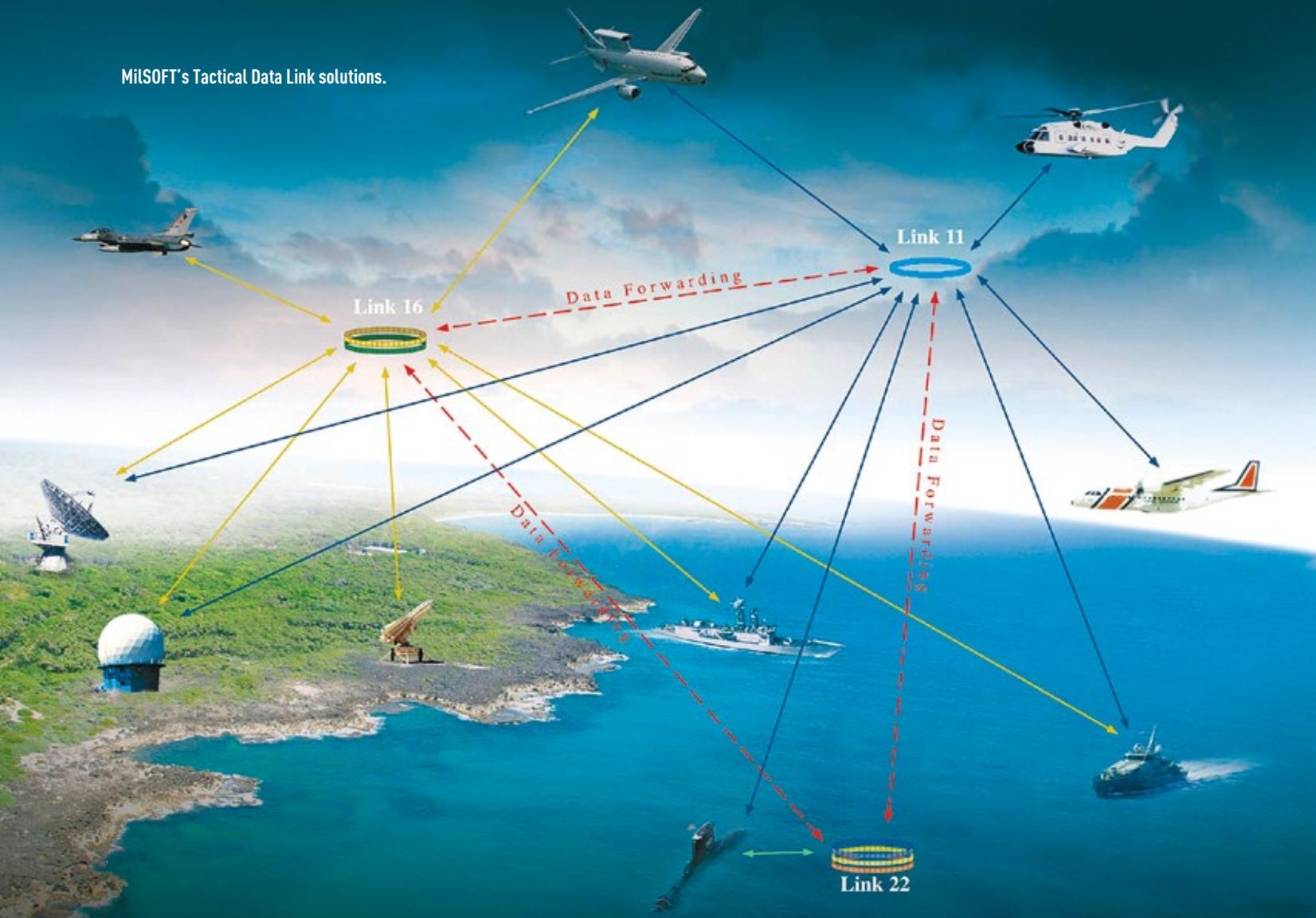


**TTAF Savunma Sanayi ve Ticaret A.Ş.**

Ostim Mah. Ahi Evran Cad. 1212. Sok. No: 24 06370 Ostim Yenimahalle, Ankara, Turkey  
info@ttafsavunma.com.tr www.ttafsavunma.com.tr  
Tel: +90 312 386 22 66 Fax: +90 312 386 35 36



MilSOFT's Tactical Data Link solutions.



# MilSOFT is Ready to Further Share Technology and Experience with Pakistan

MilSOFT Yazılım Teknolojileri A.Ş. was established in 1998 as a 100% Turkish and private company.

We are specialized in system integration and software development for the defence industry. Besides the defence industry, we develop technologies for the public security and telecommunications industries.

All photographs: © MilSOFT

MilSOFT's headquarters is located at METU Technopolis, Ankara. Our own building has the facility security clearances in the level of both "NATO Secret" and "National Secret." MilSOFT has two more regional offices: Technopark İstanbul and the newest one in Washington D.C. MilSOFT now has around 200 employees worldwide. MilSOFT's mission is to develop high-end products by using the latest software technologies. From the beginning, MilSOFT has aimed to compete in high technology field with the most advanced companies in both national and international areas by developing her indigenous products. We strive to maximize customer satisfaction via our deep domain expertise and solid system and software engineering methodologies.

One of the unique specialties of MilSOFT is its excellent compliance to international standards. In February 2005, based on our software quality and the capability of software development process, MilSOFT has become the first company in Europe and so far the only one in Turkey to achieve CMMI Level 5 (which is the highest level a company can achieve according to the CMMI methodology). We have the honour of holding CMMI Level 5 certification for three more years for the fourth time in a row as a result of the latest assessment completed on the 20th of December 2013. Besides being a CMMI Level 5 company, MilSOFT has also NATO AQAP-2110, NATO AQAP-2210, NATO AQAP-160, TS-EN-ISO 27001:2013 and TS-EN-ISO 9001:2008 certificates.

In MilSOFT we help our customers leap in to the future through advanced technology. We anticipate future customer demands and launch R&D projects. When the customers are ready, we turn our R&D results into innovative solutions and deploy them into their operational environment. Frequently, customers come directly to us for new technology developments. Being CMMI Level 5, MilSOFT has the deep experience and knowledge to deliver high quality indigenous products within budget and most importantly within the given project schedule.

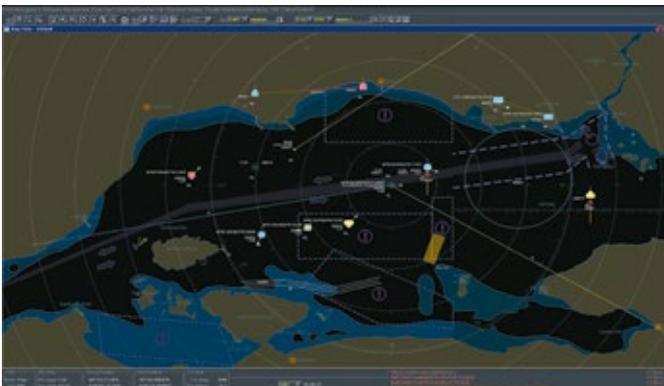
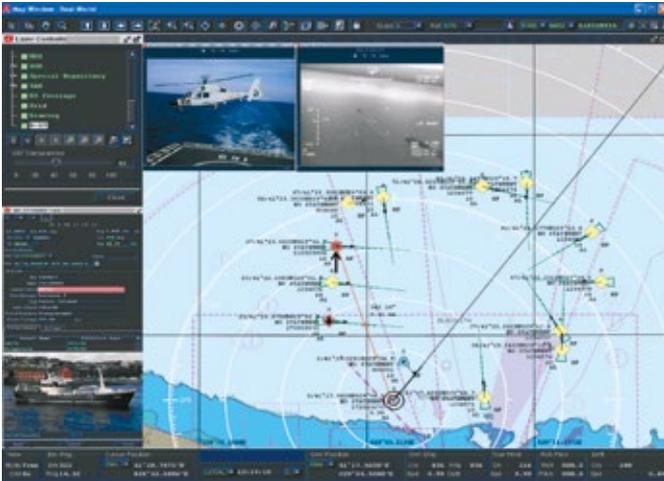
All these projects over the years created a lot of expertise and assets. Today, we have our own products developed nationally without any license restriction to third parties. Still, with the support of The Scientific and Technological Research Council of Turkey (TÜBİTAK), MilSOFT continuously initiates new R&D projects in new areas.

Furthermore, MilSOFT has already proven itself internationally. We are able to directly market our products internationally, to government and private organizations. We have already won international tenders.

Our main interest areas are C4I Systems, Data Links and Messaging, Image Exploitation Systems, Electronic Warfare (EW), Modelling and Simulation, Embedded Systems, ICT Solutions and Cyber Security technologies. Within these areas MilSOFT has already provided critical software solutions to Turkish Armed Forces and international market.

As MilSOFT, we have already ongoing projects in our brother country Pakistan, and would like to further share our technology and experience with Pakistan and to explore additional possible partnerships with Pakistani counterparts.

Screen shots from MilSOFT's Combat Management System.



**Military Vehicle  
Electronics  
& System  
Engineering  
Solution Center**

**ayyazılım**



**Complete Turnkey Solution  
Including Military Cabling  
& System Integration**



**System solutions with analog indicators**



**Modern integrated dashboard panel  
with LCD display**

**MAIN SOLUTION PARTNERS**

**Thermal management solution provider**

**AMETEK®**

*Aerospace & Defense*

**Military cabling materials supplier**

**Raytech**

Silikon Binası Giriş Kat No:8 Teknokent 06531 ODTU Ankara Turkey  
Phone: +90 312 210 18 60 / Fax: +90 312 210 11 35  
www.ayyazilim.com.tr / E-mail: ayyazilim@ayyazilim.com.tr

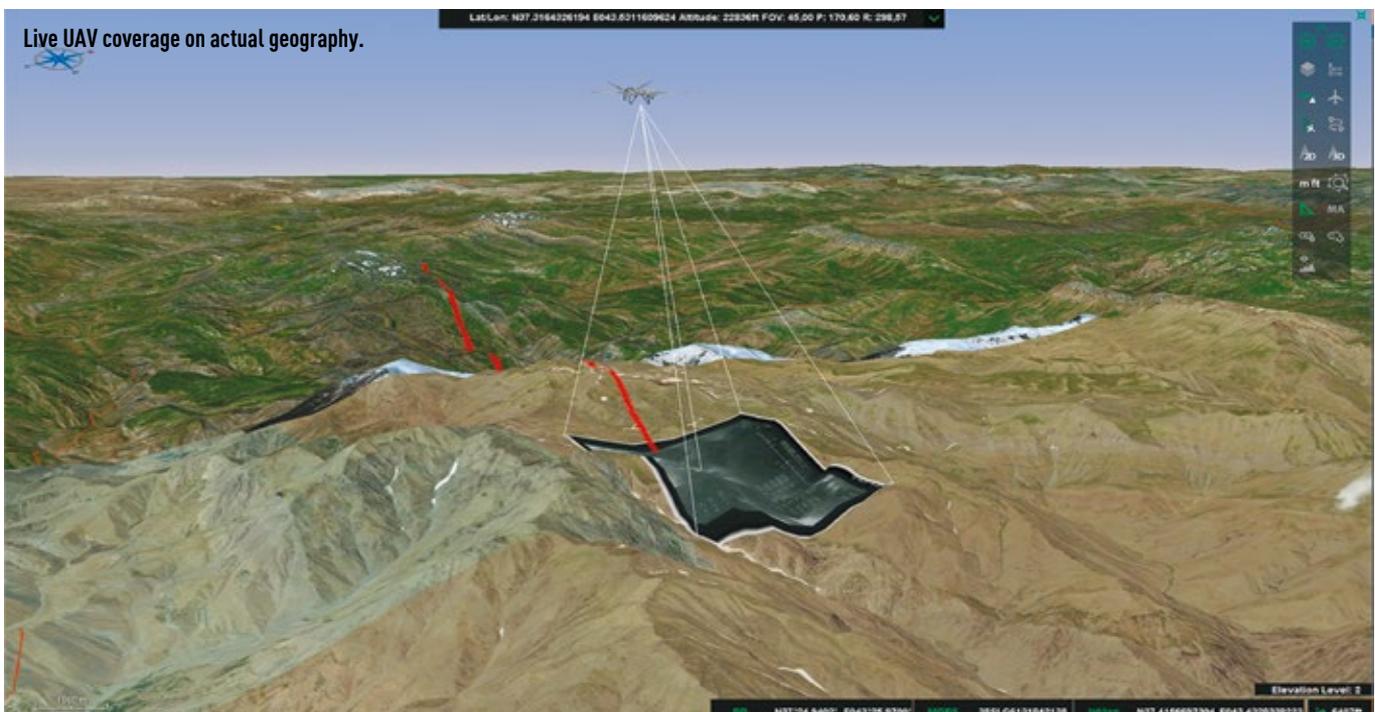
## Important Milestones of MilSOFT

- With the contract signed with Sikorsky, MilSOFT became the first Turkish company having a role in Mission Computer Development Project.
- The first Turkish software used in NATO JWID Exercises belongs to MilSOFT.
- The first critical software contract awarded to a Turkish company in the international market belongs to MilSOFT, with Sikorsky S-92 Maintenance Data Computer Software Project.
- MilSOFT became the first company in Turkey who achieved CMM Level 3.
- MilSOFT received her first national contract as a prime contractor for JETS (Joint Electronic Warfare Training System) and JETSIM (Joint Electronic Warfare Training Simulation) and delivered them successfully before its deadline.
- MilSOFT became the first company in Europe and Turkey who achieved CMMI Level 5, and still, MilSOFT is the only company in Turkey who holds this level.
- MilSOFT has developed the Image Exploitation Software for the purpose of Image Intelligence which is the main mission of Unmanned Air Vehicles.
- MilSOFT has developed Electronic Warfare Programming and Simulation Laboratory to Turkish Navy and again, delivered it ahead of its schedule.
- MilSOFT established her Gebze Office in Technological Free Zone area of TÜBİTAK Marmara Research Centre.
- MilSOFT received a contract from Turkish Navy, which made her one of the major players in the world in Multi Data Links area.
- MilSOFT received the Technological Success Award with National Combat Management System based on the latest technology with indigenous design.

- Up to now, MilSOFT has invested a total of 38 million dollars in R&D of which, 13 million dollars was supported by TÜBİTAK.
- All of the technologies MilSOFT has developed were successfully used in national and international projects.
- Turkey's Coast Guard Search and Rescue Ships are on duty with the first and only nationally designed Combat Management System.
- Turkish Navy's ships are communicating with aircrafts of Turkish Air Force and NATO units with MilSOFT's indigenous system.
- More than 2,000 Electronic Warfare Officers of Turkish Armed Forces were trained with MilSOFT's Electronic Warfare Training Simulation system.
- Unmanned Air Vehicles are continuing to their main mission, "Image Intelligence", successfully with MilSOFT software.
- MilSOFT made Turkey one of the leading countries in Europe in terms of "Quality in Software."

## Some Unclassified References of MilSOFT

- Sikorsky Aircraft
  - SeaHawk Helicopter Mission Computer
  - S-92 Helicopter Maintenance Data Computer Software
  - Avionics Video Symbols Generation Software
- Rockwell Collins France
  - Airborne Data Link Processor Software Development
  - Digital Environment Simulator
- Lürssen
  - Ship Simulator
- Thales Airborne & Thales Communication
  - Link-16 based Link 11 Data Link Processor Software
  - Flight Test Instrumentation Software
  - Tactical Command System Plug-in Component Link-11 Software
  - Tactical Data Link System Integration and Tests





- Thales Underwater
  - Acoustic Mission Planning System
- Turkish Armed Forces
  - JETS
  - JETSIM
- Turkish Land Forces
  - HiSAR Medium Altitude Air Defence Missile System
  - Link-16 Software
- Turkish Naval Forces
  - Gabya (Ex-Perry) Class Frigates
    - ▲ Command Control System Middleware Software
    - ▲ Link 11 & Link 16 Tactical Data Link Processor Consoles
  - MİLGEM Corvette
    - ▲ Command Control System Middleware Software
    - ▲ Link 11 & Link 16 Tactical Data Link Processor and Link Consoles
  - LST (Landing Ship Tank)
    - ▲ Link 11 & Link 16 Tactical Data Link Processor
  - Electronic Warfare Programming and Simulation Centre
  - S-70B Helicopter Simulation Centre Link-11 Simulator
- Turkish Air Force
  - C-130 Link-16 Software
- Turkish Coast Guard Command
  - Coast Guard Search and Rescue Ship, Scalable CMS based on DDS & OACE
  - Coastal Surveillance C2I System
- TAI
  - UAV, Transportable Image Exploitation System, Remote Video Terminal
  - UAV (MALE) Ground Control Station Mission Systems
- Lloyd's Register
  - Fortran Solver Migration Project
- NAVSEA/BAV
  - Evolved Sea Sparrow Missile Integration to Turkish Frigates
- TKMS
  - Link 11 & Link 22 DLP and Consoles to Air Independent Propulsion Submarine
  - Integration between ISUS 9072 Weapon Control System and DLP
- Alenia Aeronautica
  - Meltem-3 Link-16 Solution
- ASELSAN, ROKETSAN, MİKES
  - Mil-DDS - DDS Middleware Software
- Turkish Prime Ministry
  - Mil-EMIS Crisis/Emergency Management Information System
- İstanbul Governorship
  - Mil-EMIS Crisis/Emergency Management Information System
- Turkish State Meteorological Service
  - Observation Systems Maintenance Repair and Material Tracking Program
- Otokar
  - Mil-TRAC-Lifecycle Support & Management Information System for Main Battle Tank
- Oman Air Force
  - EW Training



## TURKISH DEFENCE INDUSTRY NEWS

### The Synergy Center of Defence Industry

Turkish Defence Industry  
News GROUP



## EJDER YALÇIN 4x4: Best of its Class

Since its journey began in 2012, the EJDER YALÇIN 4x4, developed by Nurol Makina to respond to emerging threats, has become best of its class following improvements made through user input. By experiencing significant operational use, the Ejder Family vehicles continue to serve successfully in the inventories of the Turkish Armed Forces and police forces. While the delivery of signed contracts are currently in process, a new contract covering 180 vehicles has just been signed.

**E**JDER YALÇIN stands out as a vehicle in its class with its 4x4 design, field performance, survival features, operational capabilities and high internal space. In accordance with the ballistic protection features, having a payload capacity up to four tonnes, various weapon turrets and weapons can be integrated on the EJDER YALÇIN 4x4, in compliance with the requirements of the user. In this context, it is possible to integrate manual and remotely controlled turrets, and is also adequate for the use of 7.62 mm and 12.7 mm automatic grenade throwers, anti-aircraft weapons and anti-tank weapons. Technical features of the vehicle are listed in Table 1. The EJDER YALÇIN 4x4 is outstanding for its multi-task structure, which can be used on the same platform for reconnaissance and surveillance missions, command and control, internal security, ambulance, a CBRN vehicle, border patrol/security, a bomb detection and disposal vehicle, armoured ambulance, weapons carrier vehicle, armoured personnel carrier and combat vehicle. Moreover, in accordance with user requirement, its payload carrying capacity enables the vehicle to be used for various tasks and operational equipment.

### Full Protection for the Personnel

One of the outstanding design parameters of the EJDER YALÇIN 4x4 is that it allows personnel to perform their duties under high protection. The vehicle can be armoured at different protection levels in accordance with user requirement. Due to advantages,



such as welding zones strengthened using the mechanical locking method, monocoque body, 'V' shaped base design, mine-resistant seats and floating base system, the EJDER YALÇIN 4x4 provides a high level of protection against mines and improvised explosive devices (IED). As international standards against kinetic energy ammunitions do not cover the nature of threats in Turkey, the EJDER YALÇIN 4x4 is designed with a 360 degrees protection concept, in accordance with the protection value required by the user. As a result of the high level of the payload carrying feature, additional armour may also be mounted on the vehicle, in accordance with user requirements. Furthermore, due to birdcage and resilient armour applications, protection against RPG attacks can also be provided.

### Difficult Field Conditions is not a Problem for EJDER YALÇIN

The EJDER YALÇIN 4x4 is a dynamic vehicle that meets all kinds of requirements for military units and police forces in both urban and rural areas. The fully independent suspension system and selected wheel size provide high performance driving in all kinds of terrain. The Central Tyre Inflation System (CTIS), in all tyres, constantly controls the tyre pressures and when necessary can change tyre pressures while moving. This feature is just one of the factors that increases the performance of the EJDER YALÇIN 4x4 in difficult field conditions.

A diesel engine is used on the vehicle as a standard, providing min 350 BG 1,550 Nm torque at 2,100 revolutions/minute in standard vehicles. The continuous 4x4 traction feature is provided, as six forward, one reverse gear and a fully automatic transmission box is used on the vehicle and through the differential feature and transfer gear case comprising two high-range and one neutral gear.

The engine, transmission box and vehicle traction system are controlled using algorithms developed by Nurol Makina, according to the SAE J1939 protocol.

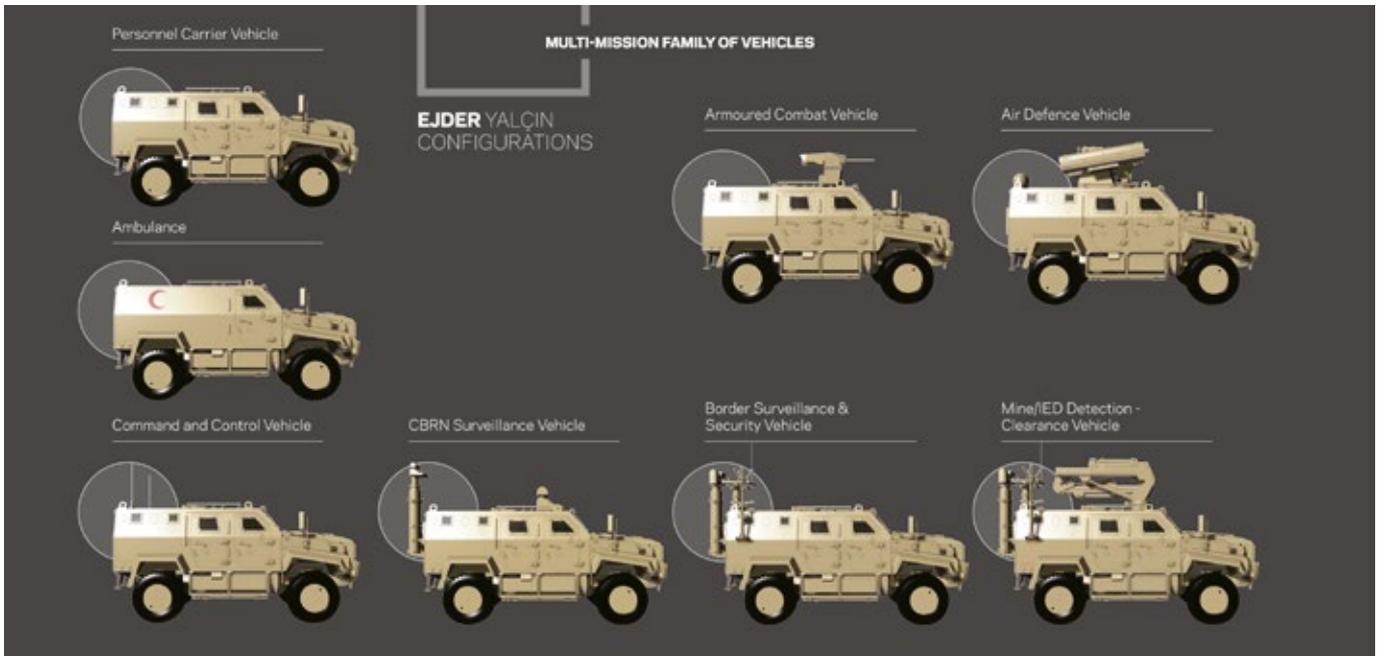
### Leader of the Commanders in the Tactical Field

Due to its special design, the EJDER YALÇIN 4x4 has a seating arrangement that provides the straightforward, comfortable and ergonomic deployment of personnel. Seating arrangements can also be organised in different configurations, in accordance with the intended use of the vehicle and requirements of the user. The capacity of the vehicle, which is currently arranged for nine people, can be increased to eleven, in accordance with its intended use and the use of the turret. Door configuration on the vehicle allows for the rapid entry and exit of the personnel. Firing ports on the body and windshield are designed in a



**Table 1. EJDER YALÇIN 4x4 Technical Features**

Crew	Up to 11 persons
Length	5,711 mm
Width	2,500 mm
Height	2,453 mm
Ground Clearance	min. 450 mm
Wheelbase	3,255 mm
Combat Weight	14 to 16 tonnes (vaires according to protection requirements and mission equipment)
Maximum Speed	110 km/h
Range	600 km
Engine	Cummins Isle 375
Acceleration (0-40 km/h)	6 s
Obstacle Climbing	0.5 m
Trench Crossing	1.1 m
Fording	0.7 m
Gradient	60%
Side Slope	30%
Turning Radius	7.5 m



way to ensure the advantageous use of different weapons. Day-night vision systems, optionally mounted on the vehicle, provide for surveillance in different environments. To assist personnel when changing a tyre, there is also a crane system in the section where the spare tyre is stored. To ensure that the vehicle can rescue itself when necessary, or assist with different elements, a hydraulic driven rescue winch is mounted on the vehicle as optional equipment.

**Full Marks from Users**

The EJDER YALÇIN 4x4 has successfully passed difficult tests, including those for mines, ballistic protection with kinetic energy ammunition; also, mine seat, environmental adaptation, power pack resistance and mobility tests. Recently, the vehicle has also been used intensively in counter-terrorism operations in Turkey, and continues to receive full marks from its users.



*"The only sustainable competitive advantage is  
learning faster than the competition"*

*Arie de Geus*

# MRTP

A TURKISH CONCEPT,

A WORLD TECHNOLOGY LEADER

TO PROTECT THE PEACE AND THE PEOPLE



**YONCA - ONUK JV**

KIZILÇAM SOKAK 8, AYDINTEPE  
34947 TUZLA, ISTANBUL

TEL: +90 (216) 392 99 70

FAX: +90 (216) 392 99 69

[www.yonca-onuk.com](http://www.yonca-onuk.com)

**YONtech**





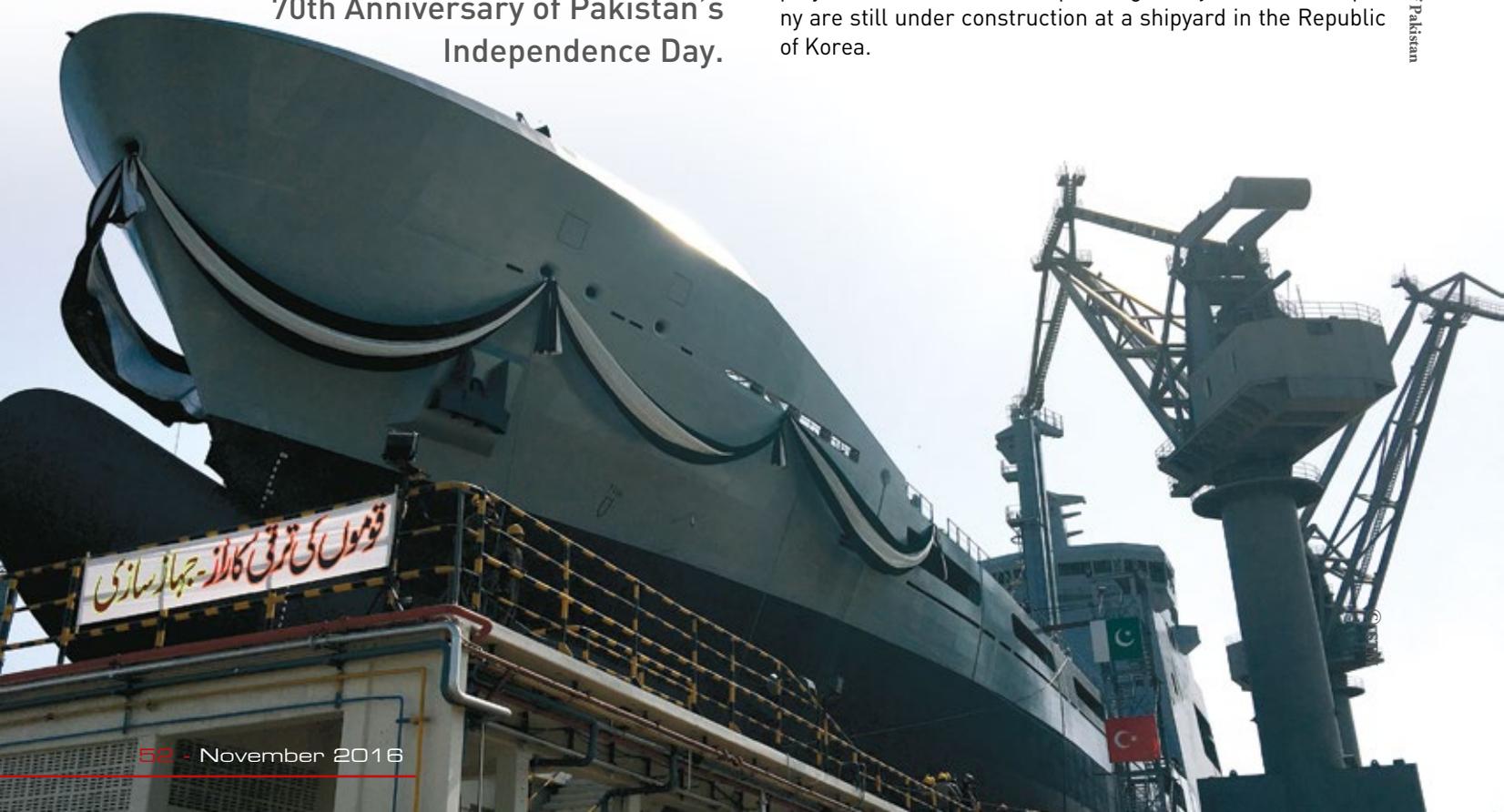
## A Proud Day for STM: Pakistan's Fleet Tanker Launched

In the Pakistan Navy Fleet Tanker Procurement Project, where STM (STM Defense Technologies Engineering and Trade Inc.) is the prime contractor, the most important milestone before delivery has been achieved. The Fleet Tanker, which was built in the Karachi Shipyard, was launched on August 19, two months ahead of schedule, with a ceremony held on the occasion of the 70th Anniversary of Pakistan's Independence Day.

*K. Burak CODUR / b.codur@milscint.com*

The Fleet Tanker Procurement Project, for which the contract was signed on January 22, 2013, and the steel cutting ceremony was held on November 27, 2013, is a groundbreaking project in many respects for both Pakistan and Turkey. While the tanker is Pakistan's largest ship in terms of its tonnage, ever built in the country, the project also distinguishes itself as being Turkey's largest ever single naval platform export in terms of budget. With this project, STM has also become one of the companies carrying out both the design and modernisation of naval platforms, despite not having its own shipyard. This business model, which is becoming increasingly widespread in recent years, first attracted attention by the next generation tanker ship project of Great Britain. Ships designed by a British company are still under construction at a shipyard in the Republic of Korea.

Unless otherwise stated, all photographs: © Prime Ministry of Pakistan





ing for the Pakistan Navy personnel on ship and ship systems repair and maintenance.

Meanwhile, a significant number of Turkish companies were able to take part in the Pakistan Fleet Tanker Project, largely owing to the industrialisation experience STM has gained during the MILGEM project.

### An Exemplary Project

The ceremony was attended by Nawaz Sharif, Prime Minister of Pakistan; Admiral Muhammad Zakauallah, Chief of Naval Staff of the Pakistan Navy; Prof. Dr. İsmail Demir, Undersecretary for Defence Industries; Davut Yılmaz, General Manager of STM; members of Pakistan Navy; STM employees and many senior guests.

Approximately 5,600 tons of sheet metal, 750 tons of profiles, 290 tons of welding rods, 25,000 metres of pipe, 15,000 metres of hydraulic lines, 2,200 metres of air conditioning ducts, 10,000 metres of cable channels, 230,000 metres of electric cables, 200 tons of paint and 50 tons of insulation material were used during the building and outfitting of the ship, which was constructed at the Karachi Shipyard, based on the technical data pack, materials, equipment and systems delivered by STM to Pakistan. STM provided technical courses for the officers, civil directors, engineers and workers of Karachi Shipyard, as part of the design training planned for the project, and still continues to provide train-

Rear Admiral (Upper Half) Syed Hasan Nasir Shah, Managing Director of the Karachi Shipyard, delivered the opening speech of the ceremony. Rear Admiral (Upper Half) Shah announced that Karachi Shipyard was ready to take on new, larger scale projects and shared information about two developments in the shipyard: The Karachi Shipyard will build four submarines in cooperation with China, thus adding modern submarines to its construction capabilities. In the context of the expected expansion in business volume, the construction of a ship lift and transfer system with a lifting capacity of 8,000 tons is currently underway at the shipyard. Prof. Dr. Demir, Undersecretary for Defence Industries,

## AUGMENTED REALITY TECHNOLOGIES

### “Intelligence in your vision”

- VISUAL INSPECTION AND DAMAGE ASSESSMENT
- FIELD PERFORMANCE AND OPERATIONS SUPPORT
- MANUFACTURING ANALYTICS AND REAL-TIME GUIDANCE



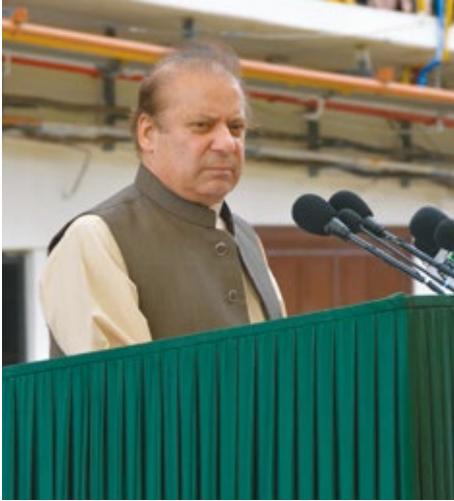
AR Supported Maintenance Operations



AR Supported Situational Awareness

# BITES

[www.bites.com.tr](http://www.bites.com.tr)



who took the floor after Rana Tanveer Hussain, Pakistan's Minister of Defence Production, first said that he was delivering the speech on behalf of Fikri Işık, the Turkish Minister of National Defence, who could not attend the ceremony due to the terrorist attack in Elazığ. He contin-

ued his speech as follows: "I would like to convey the congratulations, greetings, and good wishes of our President, Prime Minister and Minister of Defence. The Fleet Tanker, which will accelerate cooperation between our countries in the defence industry, is a project in which we can exchange



**Technical Specifications of the Fleet Tanker**

Length	158.4 m
Width	22 m
Draft	6.85 m
Displacement	15,602 tons
Maximum Speed	20 nautical miles per hour
Cruising Speed	15 nautical miles per hour
Cruising Range	10,000 nautical miles
Crew	206 (can be increased up to 222 for short periods)
Combat Systems	Phalanx 20 mm point defence system; 12.7 mm machine guns; MASS (Multi Ammunition Softkill System) decoy system; IRST (Infra-Red Search and Track) and ESM (Electronic Warfare Support Measures) systems.
Design	MARPOL (International Convention for the Prevention of Pollution from Ships) compatible double hull design. The ship's classification is based on the military ship rules of BV (Bureau Veritas).
Specifications at Times of Mission	<p>During peacetime:</p> <ul style="list-style-type: none"> <li>• While cruising; carrying out the transfer of liquids, such as fuel and water, and hard cargo such as food and medicine to other units of the navy,</li> <li>• Conducting search and rescue (SAR) operations with the helicopter deployed on it, and</li> <li>• While cruising, providing medical support to other elements of the navy.</li> </ul> <p>During wartime:</p> <ul style="list-style-type: none"> <li>• While cruising; carrying out the transfer of liquids such as fuel and water, and hard cargo such as food and medicine to other elements of the navy, and</li> <li>• Conducting Anti Submarine Warfare/ Surface Warfare with the helicopter deployed on it.</li> </ul>
Other Specifications	Hospital infrastructure, helicopter pad and hangar



our countries' capabilities through the transfer of technology, and which also enables us to cut back on costs by engaging in joint production. The project serves as an example to many others we will carry out together in the future. I would like to congratulate STM and Karachi Shipyard for having made the biggest contribution to this success." Prof. Dr. Demir also emphasised that the Fleet Tanker will remain in service in the next three-four decades and that it will play a significant role in the defence and aerospace cooperation between Turkey and Pakistan.

### The Start of a Long Term Cooperation

The last speech of the ceremony was delivered by the Prime Minister of Pakistan Nawaz Sharif, who said: "This project is an important indication of our efforts to develop indigenous systems and to engage in deeper cooperation with Turkey, a brother country. Our cooperation with Turkish companies will continue and increase in the future, and we will build new ships in Karachi Shipyard as a result of this cooperation. This ship will be a symbol of the cooperation between Pakistan and Turkey."

## STM Continues at Full Pace

The cooperation between STM and Pakistan will continue and increase even after the Fleet Tanker project is completed. Within the scope of the contract signed with the Pakistan Ministry of Defence Production, the half-life modernisation of one Agosta 90B class submarine in the inventory of Pakistan Navy will be carried out by STM. The modernisation project includes an option that covers the other two submarines, as well. Furthermore, to meet the needs of the Pakistan Navy, STM has been working for a long time on a corvette project similar to MİLGEM.

Davut Yılmaz, General Manager of STM, commented on the progress made by STM and the future of their relations with Pakistan as follows:

"In the past, foreign companies used to make the designs and send the materials, and we used to build our military ships at our own shipyards based on them; however, looking at where we stand right now, we're the ones making the design and procuring the materials. This is extremely important, since it shows the progress made by our country in the field of engineering and technology.

We have seen another tangible demonstration of this progress two months ago when we won the submarine modernisation tender, again in Pakistan. Now, I would like to share with you some more good news.

We will soon be announcing a very important achievement of ours in the international arena that will greatly please our country."

Sharif stressed that they would like to increase the defence and aerospace cooperations with Turkey not only in ship building, but in other areas as well.

Following the speeches, the Fleet Tanker was launched following the cutting of the ribbon by Prime Minister Sharif.



Meteksan Defence's DCSIM ensures a realistic training environment to develop and conduct damage control exercises.



All photographs: © Meteksan Defence



# Damage Control Simulator Preparation as well as Knowledge is Vital for Survival

The main indicators of a naval force's level of advancement are technological superiority and also well-trained crew for effective use of its platforms. The damage control skills of personnel serving in naval platforms are critical both for combat-related and also for routine skills.

**M**eteksan Defence, being mainly focused in naval programs, developed the Damage Control Simulator (DCSIM) to provide a valuable asset for navies, in order to implement the best practises. Meteksan Defence's aim is to contribute the naval damage control (DC) training, being well aware that the actions of a well-trained crew can lead to survival in an emergency at sea. Meteksan Defence's DCSIM ensures a realistic training environment to develop and conduct damage control exercises as part of damage control readiness and the internationally recognized commercial and naval standards. Its unique features are increasing the effectiveness of the training, operational efficiency and maintainability so that user can:

- Train the crew in a realistic environment (smoke, flooding, rolling etc.) for damage control,
- Plan, execute and evaluate different scenarios under different conditions,
- Improve crew's damage control, communication and reporting abilities through live trainings,
- Measure and decrease their response time under heavy (smoke, flooding, rolling etc.) conditions,
- Evaluate their individual and team performances under different live training scenarios, including adjustable hull motion for speed and angle and adjustable water level making use of specific light and sound effects,
- Observe, record and replay trainings through CCTV system,
- Overview their previous performances;
  - to plan their next training period, and
  - to compare the results,



The pressurized water is utilized for the simulations with the related pressure of the hole and the proportional water flow amount.



A drill in the simulated engine room.

- Perform preventive maintenance by recording the usage time of critical components through the automation system and timely warning the user for the related maintenance, and
- Perform easy fault finding by pin-pointing the faulty components; the system detects and indicates errors up to the Line Replaceable Unit level with BITE capability.

### Key Characteristics

The simulator resembles a part of a warship, and is composed of hull, motion, water distribution and control systems. All of the main features of the simulator are controlled by the Simulator Control System. The properties of the training vessel can be summarised as follows:

- a. The simulator has the sufficient equipment to host two repair parties of 12 trainees each plus 5 instructors to execute the training in line with the scenarios. The simulator software provides the means for the preparation of additional scenarios by the user.
- b. The simulator is a moving platform that simulates one-dimensional movement (rolling of the ship) at sea being able to roll up to 15 or 20 degrees with full load and without any restrictions, and can be stopped at any angle without any restrictions.
- c. The pressurized water is utilized for the simulations related to the missile and torpedo holes, damaged piping and flanges, and sheet tearing with the related pressure of the hole and the proportional water flow amount.
- d. The training vessel is fitted with an internal sound effect system to resemble sounds like the firing, airplane and helicopter, and explosion sounds during the training sessions.
- e. There are night, day time and emergency illumination systems. Training for the outage of electrical power is simulated by using casualty power cable and connections. There are also light strobes and light effects to enhance the simulation of explosion, detonation and fire.
- f. The capabilities and abilities for carrying out the actual trainings indicated below are available in the compartments for wet training:
  - Shoring, driving a quoin and a wedge,
  - Hat patch implementation,
  - Water draining techniques, repair of damaged pipe or flange circuit,

- Smoke exhausting techniques,
- Wet and the soft patch application,
- Plotting, communications and standard reporting.

### General Layout

The platform has two decks to host the wet training areas like diesel generator room, mess deck or room, galley, and pump room. Including an open deck on board are also local control rooms, bridge or damage control centre and passageways.

As soon as the system is powered up, diagnostics controls are automatically performed, and the system is ready for operation, and following actions are performed from main control system.

- Angle of roll and speed can be changed,
- Hull can be stopped in desired angle and position, and moved to zero rest position slowly.

Based on the state-of-the-art design, the simulator provides the opportunity to monitor and record the trainings for the evaluation and to brief the trainees.

Command and control of the simulator and the trainings are performed in a user-friendly manner, which prevents failures by operators, thanks to the design of the interfaces. The software and the safety systems in the DCSIM operate in a full compliance to provide a safe environment for damage control trainings.

The software includes predefined emergency situations and the predefined responses of the system to keep the trainers, trainees and the complete system in safe position in emergency conditions.

### Control System

The real time PLC based control system with user friendly interface software enables fresh and clean water supply and distribution to the training objects like simulation of damages, splits etc. with the correct pressure and flow. The system controls flow, pressure and related valves of the selectable damage, according to the scenario.

The control system permits the operator to select training exercises from an established program of lessons, to develop new ones, to initiate and monitor training exercises, and to monitor all simulator conditions and systems.

After the selection of the scenario (selection of the training and damage), the related valves are automatically opened to simulate flooding as the requirement of the scenario.



The real time PLC based control system enables fresh and clean water supply.



Students can work on repair of a simulated damage.

Control system handles also motion control, ventilation, smoke generation, water treatment, lighting as well as water supply and safety.

### Safety Futures

The total equipment is built in accordance with the current international safety directives, and the Regulations for Prevention of Accidents.

Safety switches are available for use in case of an emergency in command and control room, in the damage control room and in the trainer's observation room. When any of the manual safety switches is activated training terminates, simulator reaches its start-up position safely and smoothly, the water and the smoke are discharged.

The system and devices are designed and produced so that

they do not fail because of the operator mistakes. In these cases, the operators are warned, and the process is not carried out. The devices and units are easily accessible for maintenance.

The materials used in the construction of the simulators and the residuals after the use of the simulators are not harmful for the environment and human health.

There are wide range of equipment and instruments in the system for both safety reasons and control issues:

- Level transmitters,
- Temperature sensors,
- Control and discharge valves,
- Pressure switches,
- Emergency shutdown system,
- Day and night cameras with Infrared Spots,
- PA system.

### Training Evaluation System

Mobile evaluation panels, PLC controlled data collection and evaluation software are the main components.

There are two sources of evaluation;

- a. Subjective Grades: The evaluation will be done by trainer through mobile touch panels. Trainers decide if the subjected training failed, standard or successful.
- b. Automatic Grades: The evaluation will be done by system itself automatically. The goal is defined as target duration for training and systems automatically detects if the training is completed within pre-set duration.

### In Conclusion

Meteksan Defence's training vessel based on above outlined capabilities provides a well realistic training environment that prepares members of repair party teams to react more efficiently and effectively to actual casualties.

DCSIM for Turkish Naval Forces Command is placed in Gölcük, Turkey as part of the Surface Training Centre of the Fleet. The project also includes firefighting training simulator for basic trainings, submarine fires, advanced level ship trainer and "crash on deck" helicopter fire simulator.

Another contract was signed with Sultanate of Oman Ministry of Defense in 2012 for DCSIM to provide a state-of-the-art capability for Royal Navy of Oman, and the system is now successfully operational.

We continue proudly to serve naval community to train the crew of vessels as part of sea-readiness.



The simulator is a moving platform, being able to roll up to 15 or 20 degrees with full load.



HAVELSAN provides many sub-systems for MİLGEM corvettes, GENESIS being the major one.

# HAVELSAN:

## The Largest Local Prime Contractor and Leading Solution Partner of Turkish Naval Forces Command

Today, HAVELSAN is capable of offering products and services for all elements of the armed forces and also renown because of large e-state projects at the civilian side. HAVELSAN also takes pride in being the largest local prime contractor and the leading solution partner of the Turkish Naval Forces Command (TNFC) due to various projects in the maritime area that it has successfully implemented and delivered during the past decade. In this article, you will read about the 'success story' that HAVELSAN has achieved in the National Ship (MİLGEM) programme; the focal point of our defence industry's move towards the nationalization of products.

### What is a Combat Management System?

Combat Management System (CMS), as a critical component of the main warfare system in platforms, is a system that;

- Meets the command and control requirements of the command staff,
- Ensures the creation and sustaining of the tactical picture,
- Provides the needed decision support for the assessment of the tactical situation and transforms it to an advantage,
- Allocates sensors,
- Fulfils all activities related to weapons engagement planning and their application through the use of advanced technology.

### HAVELSAN: From GENESIS to MİLGEM

HAVELSAN's activities for CMS commenced with the Ship Integrated Combat Management System (GENESIS), the flagship of its naval projects. HAVELSAN had previously undertaken the task of developing the mission software and ground systems for MELTEM-2, the first naval project. The commitment to modernise the obsolete command and control and electronic systems of Gabya class (American

Oliver Hazard Perry class frigates, by using indigenous capabilities, evolved into a project... HAVELSAN, had mainly undertaken projects for the Turkish Air Force Command since its establishment, proved itself with these projects, and progressed to become a star of the Turkish defence and aerospace industry, assumed for the first time the task of industrialising a naval system. The GENESIS initiative was crowned with a contract, awarded towards the end of 2004. Turkish Naval Research Centre Command (ARMERKOM), which concluded the prototype development process, transferred the product development, production, overhaul/ maintenance and marketing phases of CMS to HAVELSAN by means of a protocol. The first ship of the project, that covers systems integration on eight ships, was upgraded with real-time command and control capability and was delivered in 2007. Within the scope of the modernisation activities, HAVELSAN, with contributions from Gölcük Shipyard Command, successfully completed the integration of GENESIS CMS, in terms of both the platform and existing weapons and sensors, and has led the way in the world with respect to modernization of Gabya class frigates. In a project that could only be attempted by a small number of navies across the world, HAVELSAN, which assumed responsibility of modernisation, also maintained its primary objective of indigenisation, and increased the local participation to 50 percent. As a result of the contributions made by HAVELSAN, which is known for its outstanding accomplishments in delivering within the project's schedule and budget, eight modernised frigates in the Gabya class, with GENESIS CMS installed, is performing various naval missions in the world's seas.

HAVELSAN assumed a critical role for the first and second ships of the MİLGEM project with a customised version of GENESIS CMS for the MİLGEM platform. GENESIS CMS,



Bridge of MİLGEM

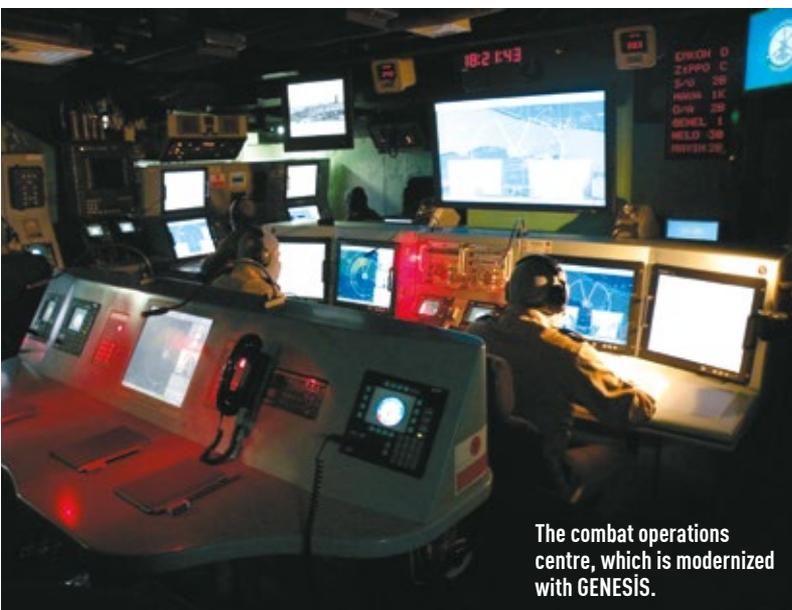
which is being used on the MİLGEM 1-2 platforms, meets the operational requirements of the current naval warfare platforms. However, due to technological developments in the field of software and hardware, and the requirements anticipated to emerge in the near future, the need for developing a new generation of CMS has also emerged. For this purpose, 'GENESIS - Network Centric Warfare (ADVENT) System' project was launched at ARMERKOM. In this context, a protocol was signed in March 2010 between the TNFC and HAVELSAN for the joint development of the GENESIS-ADVENT system.

### Transition to Future Technology: ADVENT

GENESIS ADVENT CMS is the indigenous combat management system developed by TNFC, in collaboration with HAVELSAN, which will be used in new ship construction and modernisation projects, in line with changing threats and operational needs as well as technological developments in the area of hardware and software. GENESIS-ADVENT CMS meets the requirements of the network-based operations approach, a defence technology of the future, as well as allowing access to tactical data link (TDL) functions through all operator consoles. Allowing the user to take accurate and rapid decisions, due to its decision support systems, in terms of using new weapons and sensors, the system also has a flexible configuration. All these features make GENESIS-ADVENT CMS an efficient new generation of reliable, original and indigenous combat management system, supported by modern technologies and open to development and expansion, also more scalable and safe when compared to other current solutions.

Completed in 2014, as a result of joint work undertaken by ARMERKOM and HAVELSAN since 2010, the core system will be adapted to platform requirements and integrated with sensors and weapon systems. These are specific to the platform and will be initially integrated to MİLGEM 3-4 corvettes and then to the Landing Platform Dock (LPD), which will be the largest military ship in Turkey.

Although GENESIS-ADVENT CMS was designed to meet the requirements of surface ships, its essential components involves core functions that can be used in all CMSs. For this reason, following the necessary adaptations, it is envisaged that the product will be used in different platforms. It is thought that adapting the same basic product to different platforms of the Turkish Armed Forces will be the most effective solution for meeting the requirements of network-based capabilities.



The combat operations centre, which is modernized with GENESIS.

## Our Gains

Competency and capabilities that began with GENESIS and arrived at GENESIS-ADVENT have transformed CMS into having network-centric capabilities that were not previously available in Turkey and are compatible with changing operation requirements through the use of entirely indigenous resources and new technologies. The work, which has increased the indigenous contribution rate in the defence industry and has reduced Turkey's dependency on other countries, as a result of the created added value, has brought about an ambitious export product for Turkey. Initially, the system will be integrated into the new platforms to be built and then the ones requiring modernisation in the Turkish Naval Forces Command. This situation will pave the way for extending the network-centric operational capability to all platforms.

Designed with an innovative approach, by reducing vulnerability in processing, circulation and displaying data, in case of failures it is expected that CMS hardware architecture will be minimally affected. Offering the possibility of using new communication methods, which might emerge in the future through tactical data links (Link 11 Link 16, Link 22, JREAP, SIMPLE) and supporting data sharing through these methods, the system also allows the joint use of systems, sensors, and weapon systems across the mission group.

Raw data, received from a large number of sensors of varying types, is processed by signature management software and original data fusion algorithms, developed at a speed required by operational requirements, supporting the basic and new combat types, as well as the indigenous development of decision support and doctrine management software.

## Conclusion

The knowledge and experience gained by HAVELSAN as a result of its decade-long journey, which is a relatively brief time span for a company, has strengthened its position as a strategic partner of TNFC. This success story, which also involves ARMERKOM, will continue with an integrated structure and synergy in light of the know-how and engineering and integration experience of both parties.

With systems developed by HAVELSAN, the first two ships of the MILGEM project, namely TCG HEYBELİADA and TCG BÜYÜKADA, are being effectively used by the TNFC. Success achieved and experience gained from the first two ships has created a pool of skills and resource for the third and fourth ships. Steps taken by ASELSAN under MILGEM, based on a business partnership model, sets a good example, and shows how two leading companies of the Turkish Armed Forces Foundation are able to accomplish successful results by consolidating their indigenous experiences. The objective of increasing the indigenousness proportion one step further with models established and each ship put into service, reduces Turkey's dependency on foreign sources, while enabling us to nationalize our critical systems.

In accordance with the purpose of its establishment, until now, HAVELSAN has developed advanced technology products for the Turkish Armed Forces with an increasingly indigenous contribution. We are aware of the importance and priority of local production, and one that is not dependent on foreign sources, for the defence of Turkey. Our objective is to add new success stories to the one that you have just read.



GENESIS integrates a number of MILGEM's sub-systems.

## Characteristics and Innovations of GENESIS-ADVENT CMS

### ARCHITECTURAL CHARACTERISTICS

- A high level of fault tolerance
  - Operators are able to assume more than one role and these can be dynamically assigned
  - All capabilities can be used from all consoles and all functions can be performed, even if only one console is available in the system
- A flexible, modular, and expandable design
- Use of open standards
- Ease of use
  - User interfaces allow users fast access and operation
  - A work-space specific to user

### FUNCTIONAL CHARACTERISTICS

- Network-centric capability
  - Processing data circulating within the network (received/transmitted) directly within CMS and the integrated availability of data within the system
  - All command and control functions can be carried out from any of the consoles
  - Providing opportunity to the joint use of sensors and weapon systems across the mission group and transition to network-centric warfare
  - Support of the use of new communication methods, which might emerge in the future in addition to tactical data links, and sharing of data through these methods.
- Advanced decision support capabilities
  - A flexible, dynamic, and rule-based system support
  - Doctrine management
  - Storage and display of signatures with all their history and their use in decision support functions
- Advanced display capabilities
  - 3D map and tactical picture display
  - 3D engagement (sensor-weapon allocation) display
- High performance data recording and rapid data play without affecting system functions
- Support for new types of warfare
- Integration of commercial off-the-shelf platform libraries to the system
- Guiding aircraft and trajectory guidance capability
- Open/close training opportunity on board



SARSILMAZ®

[www.sarsilmaz.com](http://www.sarsilmaz.com)



**SAR 223T**

**The First Original Design  
Assault Rifle of Turkey**

# KARAYEL: Already Operational and Ready for Future



KARAYEL is a tactical class UAV developed by VESTEL Defence Industry. Maiden flight was held on April 2014. Up to now 10 UAVs, 4 Ground Control Stations and 8 Ground Data Terminals have been produced. Currently Turkish Armed Forces (TAF) is operating KARAYEL UAVs simultaneously in different areas on a 24-hour basis, since October, 2015. KARAYEL has already accumulated over 2,500 flight hours.

**K**ARAYEL UAV has an endurance of 20 hours, with operating altitude up to 22,500 feet (6,858 m). Data link range is 150 km, which is dependent on terrain characteristics. It is further extended by remote Ground Data Terminals, which are located outside the main operation zone, handover. De-icing system that has been frequently utilized during the operational flights is one of the main features of the KARAYEL that leads it forward comparing to the competitors. Another important feature is the lightning strike protection enabling flight in unexpected adverse weather conditions. Thanks to triple redundant avionics architecture, where it has been concluded as a result of Fault Tree Analysis (FTA) performed according to SAE ARP4754 & ARP4761, high reliability figures are ensured.

KARAYEL carries a colour and night vision camera and transfer real-time video to the GCS placed in a mobile shelter on the ground. The live video feed can then be processed or distributed raw over the military communication/computer network. Typical KARAYEL missions include; day and night reconnaissance, surveillance, targeting and damage assessment, and adjustment of artillery fire.

Up to date, VESTEL Defence has trained over 50 TAF personnel who will be assigned as the UAVs' pilots, payload operators, mission commanders, system managers and technicians.

The three-month course was held at the 2nd Unmanned Aerial Vehicle Systems Base, where operational UAV missions are also carried out. The training was provided within a mis-

sion environment and enabled users of all levels to quickly familiarize themselves with the system. The training has allowed the trainees a rapid and direct experience of the problems, the difficulties and issues that can be encountered only during real operations, and also to see the fine details concerning the system's operational concept. During these training activities, all user requests for the improvement of the system also taken into consideration and evaluated; all feedback that was technically implementable was applied to the system, regardless of whether it required more changes than specified in the agreement.

Currently, 4 KARAYELs are operated by TAF from the forward bases and 2 from the main base.



KARAYEL Ground Control Station

KARAYEL at main operation base.



### Compliance with NATO Standards

KARAYEL complies with NATO standards, namely; STANAG 4671 and STANAG 4586. STANAG 4671 is UAV Systems Airworthiness Requirements, which were issued by NATO in September 2009, where STANAG 4586

standardizes the connection between the GCS and the aerial vehicle, to ensure interchangeability of the GCS independently from the UAV system.

The armed forces usually have different UAV solutions of various classes in their inventories countries purchase or lease UAVs to operate within the scope of their urgent needs, such as the military operations in Afghanistan and Middle East. Unless certain measures are taken, the armed forces face having various GCSs from different platforms in their inventory. NATO defined the STANAG 4586 as a response to this situation, which has created difficulties in terms of training, usage, and logistic issues. As a result, all of the UAV sys-

**KARAYEL, carrying MAM-L guided munition of ROKETSAN.**



General Abidin Ünal, Commander of TurAF, inspected capabilities of KARAYEL.

tems within NATO can be controlled and monitored through a single GCS type. The GCS console software of KARAYEL was developed in full compliance with STANAG 4586.

On the other hand, KARAYEL's system software was developed in accordance with the RTCA DO-178 guidelines, which is the highest standard of safety in aviation. Moreover, the GCS software is also capable of meeting the relevant requirements of STANAG 4671. KARAYEL's design activities were closely monitored by the STM, the airworthiness agency of Turkish Ministry of National Defence.





### More than an Armed UAV

KARAYEL, which completed its flight and ground tests in mid-April following a three months' work within the context of ammunition integration activities, finally received the call it was expecting for conducting the firing tests, and on June 15, the UAV successfully completed the first of these. KARAYEL, which was carrying one ROKETSAN made guided missile under each of its wings, successfully dropped its ammunition during several tests and guided them to strike the targets. The tests conducted in Karapınar, Konya, were also watched on-site by General Abidin Ünal, Commander of the Turkish Air Force.

During the tests, KARAYEL also exhibited capabilities that go beyond the normal mission and task of an armed UAV. In this context, a target marked by KARAYEL was hit successfully by a guided missile dropped from an F-16 aircraft. During the tests, KARAYEL's ability to hand over control to the ground

control station was also tested once again. As such, the control of the aircraft that took off from Konya was transferred to a ground control station kilometres away. Thus, in a single sortie, KARAYEL has shown that it is capable of conducting reconnaissance and surveillance; hitting designated targets or designating these targets for other aircraft; and moving beyond the initial communication range by handing over control to another ground control station.

Today the integration of UAVs into the civilian air space is just a question of time. With its exceptional safety and interoperability characteristics, KARAYEL is already well prepared for the future. In order to identify the ways in which the KARAYEL system can be further improved, Vestel Defence is continuing to work on detailed user feedback. The company is working on the integration of different payloads such as the SAR and the COMINT and expects these activities to yield new and tangible products during 2016.

## THE EASIEST WAY TO ENTER NEW MARKETS

Esnad Defense forms new export collaborations by promoting or direct marketing, through technology transfer or direct sales, of domestic and foreign defense sector products primarily in the Kingdom of Saudi Arabia and the Middle East region.



[www.esnaddefense.com](http://www.esnaddefense.com)

---

REMOTE SENSING

---

SATELLITE TECHNOLOGIES

---

ELECTRONIC MISSION SYSTEMS

---

SIMULATION & TRAINING SOLUTIONS

---



**SDT**

SPACE & DEFENCE TECHNOLOGIES

[www.sdt.com.tr](http://www.sdt.com.tr)

# Karel: The Market Leader in Communication Technologies

**K**arel, established fully with Turkish capital, developed electronic telephone switchboards with its own engineering capacity and indigenous designs, and by providing PBX products to this market, it led the transition from electro-mechanic systems of Turkey to electronic communication. Karel, without any license or know-how restrictions, owns the most advanced facilities in the field of communication electronic in Turkey and also R&D department in compliance with the international standards. Karel, the market leader in Turkey, exports its products and solutions to more than 30 countries. Karel, among top 3 in Europe and top 15 manufacturers in the world, provides services to more than 700,000 businesses with its PBX products, solely in Turkey.

With over 1,400 employees, Karel has been recently providing solutions for Turkish Armed Forces and especially for Turkish Navy in respect to communication needs for more than 15 years. Karel Military Product Family has a wide range of product variety from ruggedized communication switchboards to Public Address General Alarm (PAGA) systems. For the last 10 years, Karel has put PBX intercom systems and PAGA systems on the market for the moderate-large ships in respect to the needs of Turkish Naval Forces Command and shipyards.

## Our Objectives

In the defence industry, by extending our market to South Asia, Middle-East and Turkish Republics, conducting exporting transactions in the long term, constitutes our most significant objective. Additionally, we aim to maintain the increase in our turnover by developing our cooperation with the prime contractors in the home market.

By carrying on our infrastructure investments for R&D activities in defence industry, we plan to improve our test capabilities. We believe that our test capabilities in this regard will gain advantage for our company in respect to competition due to intense environmental conditions and EMC/EMI necessities in military products. Also, with our standard and process trainings which will support our design works for aerial platforms, skills of R&D personnel will be honed.

## Our Product Portfolio

Karel manufactures products and solutions in respect to the needs of defence industry. Product range, which started with military communication



**DS200T Tactical Communication Switchboard**

systems, has spread to solid state discs, electronic control cards and systems, ruggedized military computers, inertial navigation devices under military standards through the years. These products are still being utilized by the Turkish Armed Forces and foreign armed forces.

Our DS200D/T series military communication systems, depending on the location of use, are differentiated from each other and customized according to land/naval uses. DS200T military switchboards are designed for harsh field conditions and they are portable and durable against impacts. DS200T, which distinguishes itself from others with features such as its backlight display and key set, receiver installed to cabinets and headset that provide ease of use and PC-based system management interface, can provide connectivity with devices such as Analog/IP/ISDN terminals, fax and modem, GSM Gateway and IP-DECT systems.

IKT intercommunication systems provide intercom solutions for naval and land vehicles. IKT systems are waterproof and appropriate for use in tough field conditions (vibrations, shock and



**Intercommunication System**





#### Alarm and Announce System

heat). With their flexible structure, they provide intercommunication and radio access to various numbers of users.

Our AD101 system, developed as an Alarm and Public Address System, meets the needs of alarm and announcement in the military ships thanks to its developed features and integrated structure. With Alarm and Address system, region-based alarms are given, announcements are made to selected regions and radio broadcast is carried out over Radio-CD.

AD101 Alarm and Address System enables alarm and announcement calls in bodies define as ship-wide or as grouped. The system operates integrated with Intercommunication Communication System and ship's switchboards. The system also has User Stations authorized over Intercommunication Communication System and external interface to alarm and announce with handset over

telephone switchboard. Power supplies, which will provide power needs of the devices, will be located within the main unit.

AD101 Alarm and Address system is a modular structure created with the integrated operation of more than one product. Units are developed according to the 19" rack cabinets. System has a power supply with both AC-DC and DC-DC feature and which can be scaled compatible with different power needs. The system is controlled and managed from the main unit. The system was designed for easy assembly and appropriate for maintenance. Thanks to the modular structure, broken units are easily replaced without damaging integrity.

Systems were developed in compliance with the military standards MIL-STD 461E and MIL-STD- 810F. By using military connectors in the system, measures were taken against corrosion, vibration and other breakdowns. Special filtering was performed to prevent noise in the power supply. With the management software, the entire system is easily configured and error statuses are easily monitored.

In GES100 System, a ship entertainment system, which operates integrated to AD101 system, two different systems, which are AAS (Public Alarm Address System) and GES (Ship Entertainment System), operate integrated. Video on demand and TV broadcasts, presenter and music chosen from other music sources over entertainment system are accessed over Entertainment Panels exclusively for the users.

SAVUNMA ÜRÜNLERİNİZE  
DAHA FAZLA **GÜÇ**  
KAZANDIRMAK İÇİN  
LİMITLERİN  
ÖTESİNDE  
ÇALIŞIYORUZ

WE ARE WORKING  
BEYOND  
LIMITATIONS  
FOR PROVIDING  
**MORE**  
**POWER**  
TO YOUR  
DEFENCE PRODUCTS



ONUK-BG.COM

ONUK-BG  
SONAR DOMLARI / SONAR DÖMERS  
MILGEM KORVETİ / MILGEM CORVETTE

# SDT Continues its Export Offensive

SDT (Space & Defence Technologies), which in early June announced that it had won the bidding opened by the Republic of Korea (South Korea) for the Embedded Training System (ETS) to be used in military training aircraft, undersigned important agreements in July relating to these projects.

At a ceremony held in Ankara on July 21, SDT and the Korean company HANGIL C&C signed two cooperation agreements for two different projects.

*Şebnem ASIL / s.asil@milscint.com*  
*Özgür Deniz KAYA / o.kaya@milscint.com*

**F**atih Ünal, Managing Director of SDT, delivered the first speech during the ceremony, during which he said: "SDT has gained considerable knowledge and experience due to its work in the areas of embedded avionics computers and live virtual simulation applications, as well as in various projects it received from the Ministry of National Defence and the Undersecretariat for Defence Industries (SSM), based on the trust it has inspired. Building on this knowledge and experience, we have also started to win international contracts in similar areas. We received the first results of our efforts in May. SDT will take part for the integration of an embedded simulation system for some fighter aircraft in Republic of Korea. On the other hand, our live virtual simulation project, i.e. the next generation ACMI (Air Combat Maneuvering Instrumentation), which we have been developing for the Turkish Air Force, is now in its certification phase. With this experience, we have found ourselves a position in the Republic of Korea. We are among the candidates for the international tender that will be announced by the Republic of Korea over the next couple of months, concerning the procurement of next generation ACMI for their fighter jets. Furthermore, togeth-



© MSI TDR

er with our Korean project partner, we are also preparing a proposal for an embedded simulation system, called the Embedded Training Unit (ETU); in other words, a version of the ACMI in the LRU form, to be placed inside the aircraft, for Korea's KF-X programme. In both projects, we are cooperating with HANGIL C&C, one of the Republic of Korea's leading simulation companies. We will submit joint bids for these tenders in accordance with the cooperation agreements we will be signing. In particular, I would like to express my thanks to SSM for providing us this leverage, in terms of offset."

Halil İbrahim Yurdakul, from SSM's Department of Industrialisation, took the floor after Ünal to deliver a brief speech. "The SSM is supporting skilled, technology-developing and innovative companies in all platforms. We hope that the ETU and ACMI programmes will be a starting point, and that they will be followed by other projects, independent of offset" said Yurdakul.

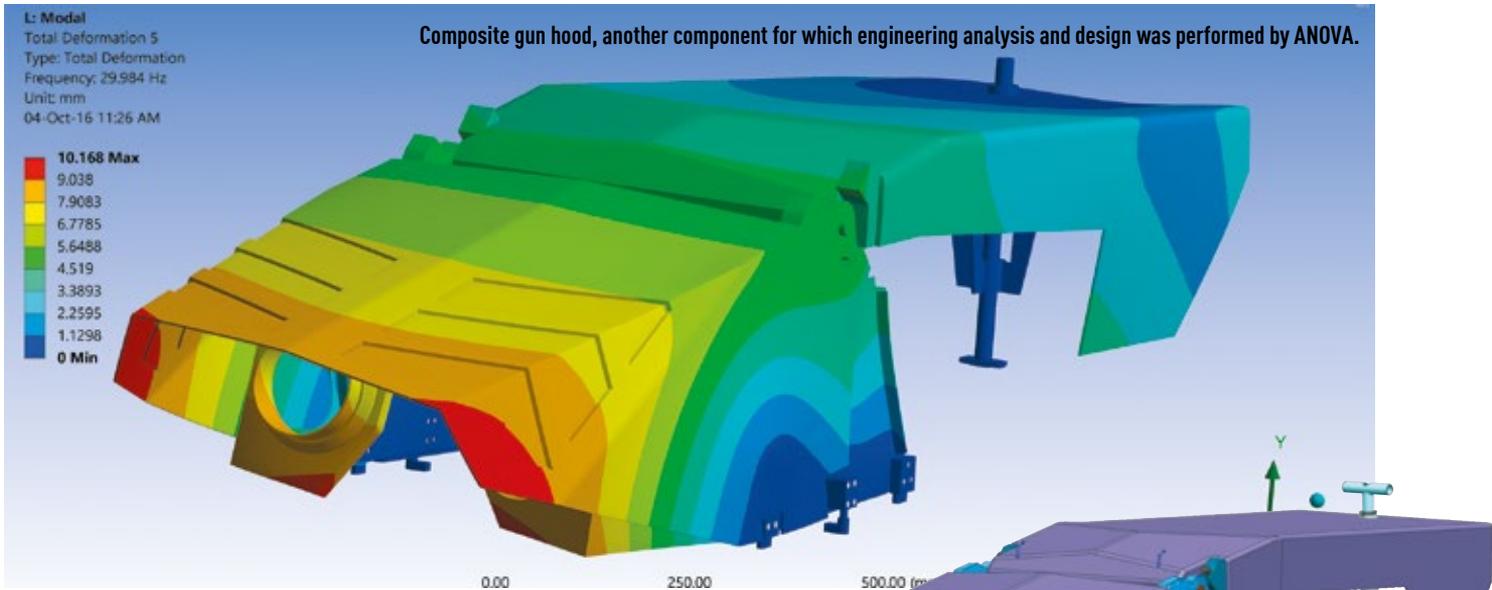
Jin H. Park, Deputy General Manager of HANGIL C&C, said that they are very pleased to be working with SDT. Following the signing of cooperation agreements by Ünal and Park, the ceremony concluded with a cocktail reception.



© Korea Aerospace Industries

KT-1





# ANOVA: The Design and Engineering Solution Partner of the Turkish Defence and Aerospace Industry

ANOVA, which provides design and engineering services for both domestic and foreign prime contractors, has in recent years been increasing its presence in the defence industry through indigenous product families such as the flexible ammunition belt. The company aims to continue operating as a solution partner for land platform manufacturers, and to expand its cooperations in this area.

**Could you briefly tell us about the main areas of activity and capabilities of ANOVA?**

ANOVA commenced its commercial activities in 2003, and operates in two

**Submarine console and cabinet designed and produced by ANOVA for ASELSAN.**

branches of the defence industry. The first of these branches is design and advanced engineering analysis, while the second is engineering software solutions. Through these activities, ANOVA positions itself as a solution partner that assists companies in the industry utilizing indigenous designs during their product development process, by helping them shorten their design processes, reduce their design costs, and improve the efficiency of their products. ANOVA aims to contribute to the efforts of the companies to which it provides services in gaining a greater presence in world markets, and also offers services in many other industries such as the automotive, energy, environment, white goods and construction.

Looking specifically at the past two or three years, I can say that we have achieved significant growth in terms of the number of personnel and capabilities. As a company, we have succeeded in bringing mechanical and electromechanical design, simulation and manufacturing capabilities under a single roof. This has allowed us to move forward in line with our vision of developing indigenous products, which we first started to do with the flexible ammunition belt product family. Our number of personnel is approaching 70. We have offices in the technology parks (teknokents) of five of Turkey's largest cities and, as of this year our manufacturing company, ANOVA SAVUNMA, has become one of the certified manufacturers in the field of machining. We have now reached the delivery stage of the cabinets used in ASELSAN's HIZIR system, which is our first manufacturing contract.

**What can you say about ANOVA's position in the industry?**



Unless otherwise stated, all photographs: © ANOVA



© MSI TDR

ANOVA's Flex Chute Product Family							
Calibre of Ammunition	Body	Weight (In Spread Form) [kg/m]	TWIST DIMENSION	FAN RADIUS [mm]		BEND RADIUS [mm]	
				(R1)	(R2)	(R1)	(R2)
7.62x51 mm	Composite Body SS Path	1	180° at 470 mm	270	270	35	35
7.62x54 mm	Composite Body SS Path	1.1	180° at 490 mm	275	275	35	35
12.7x99 mm	Aluminium Body SS Path	2.7	180° at 630 mm	133	128	20	30
12.7x108 mm	Aluminium Body SS Path	2.7	180° at 600 mm	118	150	28	35
14.5x114 mm	Aluminium Body SS Path	2.8	180° at 610 mm	125	157	28	35
25 mm	Aluminium Body SS Path	5.7	180° at 620 mm	105	120	70	50
30 mm	Aluminium Body SS Path	8	90° at 910 mm	80	175	100	55
40 mm	Composite Body SS Path	2.7	90° at 475 mm	190	190	60	60

We are trying to participate as much as possible in all activities relating to our country's defence and aerospace industry. We regularly take part in the Land Systems Seminar and the Naval Systems Seminar. At the IDEF'17 exhibition, which we consider as an event where the development and capabilities

of ANOVA will be clearly seen, the products for which we have provided design and engineering support will also be exhibited on the stands of their respective companies. Apart from these, we are also planning to launch three new products at IDEF and we are working intensively towards this.

Could you tell us about the prime contractors for which you mainly provide services in Turkey, and also about the projects you have completed or are currently working on with them?

We have worked on many different projects in recent times. Although I won't be able to mention some of them for confidentiality reasons, I can give you a list of the main projects we have completed in the previous year. These projects include:

- The Mechanical Shutdown System for the 35 mm Oerlikon anti-aircraft cannon;
- Design and aerodynamic analysis support projects with TÜBİTAK, within the scope of Electronic Warfare Pod Project;
- A mechanical design and cooling system analysis for an ASELSAN radar system;
- A resistance and shock analysis for ASELSAN weapon systems.

I can list our ongoing projects as follows:

- A 'Technology Acquisition Obligation' (TAO) of the Undersecretariat for Defence Industries (SSM) with ROKETSAN and a weapons sub-system project with ASELSAN;
- The development of 'cargo nets' for use in commercial aircraft with STM;
- The packaging and cooling of electronic units within the scope of the Electronic Warfare Pod programme, with TÜBİTAK;
- A composite weapon cover development for the 35 mm Oerlikon anti-aircraft cannon;
- A pod trolley design ; and
- The thermal design of a missile's electronic units.



© MSI TDR

12.7 x 99 mm FLEX Chute

We also have a project that is continuing at full pace on the indigenisation of an avionic system cooling unit procured from abroad, which we will be announcing shortly.

#### What can ANOVA offer to prime contractors?

It has been during the previous four or five years that we have begun to concentrate predominantly on design-related projects. In this time period, we have conducted nearly 50 projects, most of them with ASELSAN. The majority of these projects had timeframes of less than six months. Presently, our projects' timeframes have started to approach one year. At this point, we can say that we are anticipating more long-term and engineering-intensive projects from our prime contractors. In line with our capabilities, we want to take part in projects involving the indigenisation of products purchased under export licenses, and to develop products that offer great benefits with regard to costs and technology acquisition. In cases where the scope of a project expands, and our capabilities no longer cover all the work that needs to be done, there are a number of partner companies with different capabilities that we can work with. We believe it is very important for the future of the industry that small- and medium-sized companies, especially the ones in tek-nokents, are able to join forces to take part in such projects.

In our ongoing projects, we are not focusing exclusively on a single subject. We can design cooling systems, just as we can design turbo-machines and hydraulic systems... We are also involved in civil aviation projects. All of these are as a result of the effective use of design and simulation technologies by our team, which has an average of 10 years experience [in the industry]. Our aim is to make ANOVA the first company that comes to mind for prime contractors in indigenisation and technology acquisition projects.

#### Flexible Ammunition Belt was Pioneer of Change

The flexible ammunition belt was the project that made ANOVA a company with its own product. Based on this example, what can you say about your efforts to develop products?

Having a product in the defence and aerospace industry is no easy task. Over

the past 15 years, the leaders of the industry have concentrated on system and platform integration-related work. This was, undoubtedly, in parallel with the SSM's main objectives. On the other hand, it was realised during this process that the industry lacks the ability to supply the sub-systems used in platforms and main systems, and companies that produced systems found themselves obliged to procure many sub-systems from abroad. There were problems in the procurement of certain sub-systems; problems that continue to this day. Closely following this issue, the SSM considered that the solution to this problem rested on supporting engineering offices working on analysis and testing, and it shared this forecast in writing with the industry in the 2009-2016 Defence Industry Sectoral Strategy Document. Within the scope of this strategy, at ANOVA we found the opportunity to implement our plans to take part in the indigenisation and localisation of the industry.

From time to time, procuring sub-systems from abroad for use in military projects leads to issues regarding export licenses. Such issues can lead to delays in projects and increase costs. For this reason, ANOVA has, as a priority, focused on products that are not produced in Turkey and need export licenses to be purchased. As the first part of this plan, we started working together with the Mechanical Design Department of ASELSAN SST on the 12.7 mm calibre flexible ammunition belt in 2012, and managed to complete our work within about a year.

A flexible ammunition belt is a product that is used for feeding ammunition from the ammunition box to a weapon's barrel in remote-controlled weapon systems. It is manufactured by only a few producers around the world. They're also used in a similar role in air platforms as well.



12.7 x 108 mm FLEX Chute developed by ANOVA for the Russian NSV machine gun.

For example, the 20 mm calibre weapon system of the ATAK helicopter has a flexible ammunition belt. Their main features include their flexible structure and ability to adapt to different geometries between the ammunition box and the weapon system, which allows them to function in every possible scenario. The first patents for these systems go as far back as the 1950s; however, there are today only two American companies whose products are used in the field for NATO ammunition calibres.

#### How did your work progress on the flexible ammunition belt?

We developed our first flexible ammunition belt product for the 12.7x99 mm calibre ammunition as a standard off the shelf product in 2013, and commenced sales soon afterwards. The flexible ammunition belt can be used with different calibres ranging from 7.62 mm to 40 mm. Although we first started our work on flexible ammunition belts by prioritising NATO standard ammunition, we have also designed belts, based on customer requests, suitable for former Eastern Block standard ammunition. We managed to produce the first flexible ammunition belt for the NSV, a Soviet-made heavy machine gun that uses 12.7x108 mm ammunition, thus making a difference in our product range compared to our competitors. In addition to this calibre, we also devel-



TURKISH ARMED FORCES FOUNDATION

Eurasian Meeting



# IDEF'17

13<sup>th</sup> International Defence Industry Fair

May 9 - 12, 2017

BÜYÜKÇEKMECE - İSTANBUL - TÜRKİYE

[www.idef.com.tr](http://www.idef.com.tr)

  
[www.tuyap.com.tr](http://www.tuyap.com.tr)

 **ufi**  
The Global Association of the Exhibition Industry  
Approved Event

 **ICCA**  
International Congress and Convention Association

 **AEO**  
Member  
The Association of Organizers of Exhibitions  
Abroad and of National Participations in  
International Trade Fairs and Exhibitions

 **ITFD**  
Member  
TURKISH FAIR ORGANIZERS ASSOCIATION

  
K.O. TSE-EN 9001  
TS EN ISO 9001:2008

 **İSTANBUL**



**TÜYAP FAIR CONVENTION AND CONGRESS CENTER**  
Büyükkçekmece, İstanbul / Turkey

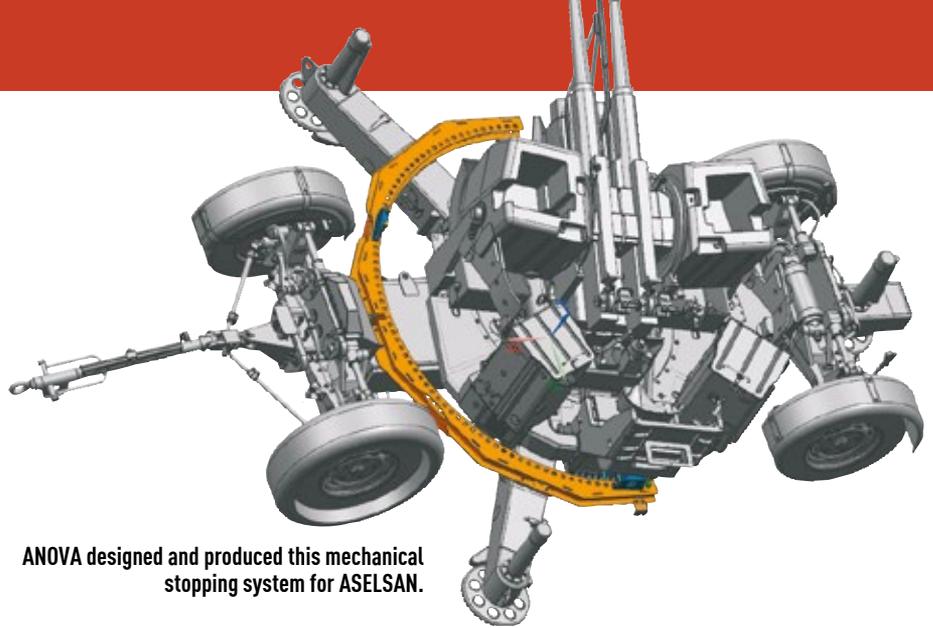
THIS FAIR IS ORGANIZED WITH THE AUDIT OF TOBB (THE UNION OF CHAMBERS AND COMMODITY EXCHANGES OF TURKEY)  
IN ACCORDANCE WITH THE LAW NO.5174.

oped and began production of flexible ammunition belts for 25 mm and 30 mm ammunitions. Owing to projects that began in mid-2015, and which were financed using our own resources, we are now about to complete our R&D studies on products for the 7.62 x 54 mm, 7.62 x 51 mm, 14.5 x 114 mm and 40 mm calibres. We initially produced the 7.62 mm and 40 mm belts exclusively with composite bodies. We are holding talks to make sure that these products can be tested on the field as soon as possible. As with the other calibres we work on, our goal for the products I've mentioned is to offer our customers the best and most advantageous solutions.

**Which aspects of your flexible ammunition belts are superior to those of your competitors?**

When designing a flexible ammunition belt, the main criteria you need to consider is ensuring the proper flow/delivery of the ammunition, and keeping the weight and friction to a minimum. In this respect, ANOVA's flexible ammunition belt designs can easily compete with those of its competitors. In fact, there are other criteria that our designs are better. We can list the general features of our products as follows:

- A stainless steel belt and aluminium or composite body to ensure an easy flow of ammunition;
- An independent and full-motion flexible body.
- Designed and verified according to military standards;
- Tested according to MIL-STD 810 G, and adequate corrosion resistance under difficult conditions;
- A special belt design and the correct materials to ensure low friction as well as minimal traction for the ammunition; and



**ANOVA designed and produced this mechanical stopping system for ASELSAN.**

- A modular structure that can be applied to every weapon system (NATO and others).

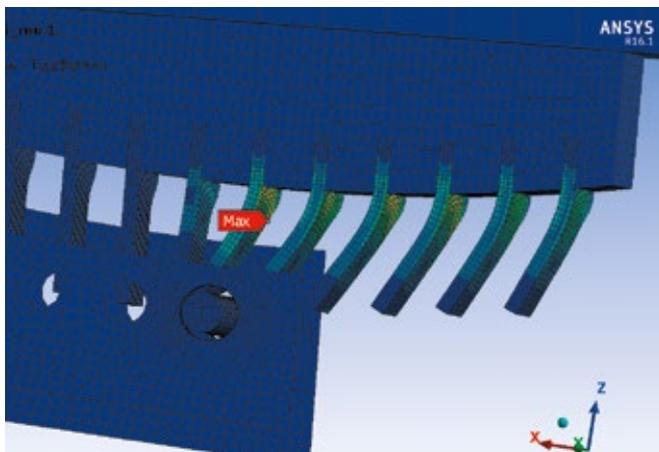
**Did you receive any support from institutions or organisation in Turkey when developing the flexible ammunition belt?**

ASELSAN provided both financial and technical support from the very beginning for the Flexible Ammunition Belt project in which the product for the 12.7 mm was first developed, thus making a valuable contribution to the indigenisation of a product that has critical importance for weapons systems. In addition, since 2013, the year when our first product was tested and approved, it has ordered more than 150 sets of products, becoming our most important customer for the flexible ammunition belt. In 2013 and 2014, we used a grant provided within the scope of the TÜBİTAK TEYBED 1507 project to begin developing the flexible ammunition belts for 25 mm and 30 mm ammunitions, which are now the two most important items in our product range. These products, which are physically larger and have a more complex structure than the 12.7 mm product, have helped raising ANOVA's self-confidence in the design of

flexible ammunition belts. In early 2015, we showcased all our completed products at the IDEF'15 exhibition, and the first customer of the 30 mm flexible ammunition belt – one the products of our development efforts – was once again ASELSAN. We also had our first delivery of the products to ASELSAN in 2015, to be used in the SMASH (MUHAFAZ) system developed for naval platforms.

**In which of Turkey's future large-scale products does ANOVA plan to participate?**

There are very important ongoing projects in our country. We hope to participate in the Indigenous Helicopter and the New Generation Light Armoured Vehicle Power Pack Development projects, and especially the Turkish Fighter Development (TF-X) project. We are currently working on this. In these projects, we plan to work on a sub-system basis, and on specific products. We are particularly confident of our abilities concerning the packaging and cooling of electronic systems, and we believe that we could be involved in meeting this kind of requirement in the TF-X project. One of our primary objectives is to take part in long-term projects in this area.



**ANOVA designed and produced this mechanical stopping system for ASELSAN.**



TURKISH DEFENCE INDUSTRY

**GLOBAL  
SOLUTIONS  
FOR LOCAL  
NEEDS**



**Turkey**  
Discover  
the potential



[tda.gov.tr](http://tda.gov.tr)  
[turkishdefence.gov.tr](http://turkishdefence.gov.tr)



[ssi.gov.tr](http://ssi.gov.tr)  
[turkishdefenceindustry.gov.tr](http://turkishdefenceindustry.gov.tr)

# Ship Building & Modernization



**STM**

ENGINEERING  
TECHNOLOGY  
CONSULTANCY