



**WAR AND PEACE STUDIES CONGRESS (WAPSCON-2025) 21ST CENTURY
ARMED CONFLICTS: CHANGING DYNAMICS AND EMERGING LESSONS
(23-24 OCTOBER 2025-ONLINE) (BOOK OF PROCEEDINGS)**

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(E) Kur. Alb. Doç. Dr. Ali Bilgin Varlık

Dr. Öğr. Üyesi Selma Şekercioğlu Bozacıoğlu



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(E) KUR. ALB. DOÇ. DR. ALİ BİLGİN VARLIK
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HARP SANAT YAYINEVİNİN YAYIN ESASLARI

Harp Sanat Yayınevi, şanlı Silahlı Kuvvetlerimizde yıllarca görev yapmış olan emekli bir subay tarafından ülkemizdeki askeri tarih çalışmalarına katkı sağlamak için 2021 yılında kurulmuştur. Bilimin ışığını rehber edinen Yayınevimiz, Atatürkçü bir çizgide, bağımsız yayıncılık faaliyetlerinde bulunmayı temel ilke edinmiştir. Yayınevimiz, yayımlayacağı nitelikli eserlerle ülkemizde askeri tarih alanında hissedilen eksikliği gidermeyi amaçlamaktadır.

Bilindiği üzere toplumların tarihi incelendiğinde askerlikle ilgili hususların siyasi, sosyal ve kültürel alanlara doğrudan veya dolaylı etkilerinden söz edildiği görülmektedir. Bu etkilerin tespit ve değerlendirmesinin, günümüze ve hatta geleceğe bakan yönlerinin ortaya konulmasının fert ve devlet ölçeğindeki gelişime önemli katkılar sağlayacağı üzerinde durulmaktadır.

Sosyal bilimlerde askerî konulara ağırlık veren çalışmalar, Birinci Dünya Savaşı sonrasında önem kazanmaya başlamıştır. Zamanla genel tarih araştırmaları içinde kendine özgü bir anlayışa dönüşerek askerî tarih adı altında toplanan bu alandaki çalışmalar, Batı'da XXI. yüzyılda büyük bir hız kazanmışsa da Türkçe literatürde ne yazık ki henüz arzu edilen seviyeye ulaşamamıştır.

Karakter ve kültür kodlarımızda var olan askerliğe ve ona dair çalışmalara ivme kazandırılarak bu alandaki eksikliğin nitelikli eserlerle giderilmesine ihtiyaç duyulmaktadır. Aksi hâlde bu boşluğun akademik olmayan, ideolojik birtakım amaçlarla, bilgi ve belgeye dayanmayan yorumlarla ve popülist eserlerle doldurulması başka sorunları da beraberinde getirecek, ortak tarih bilincinin oluşumuna zarar verebilecektir.

Yayınevi olarak bu bilinçle, imkânlarımız nispetinde faydalı çalışmalar ortaya koymayı arzu ediyoruz. Bu alandaki akademisyen ve yazarlarla koordineli çalışmalar yürüterek akademik, tarafsız ve güvenilir kaynaklardan oluşan yerli ve yabancı nitelikli eserlerle okuru buluşturmak istiyoruz. Kuramsal kaynaklardan edebî eserlere kadar geniş bir yelpazede yapacağımız yayınlarla, askerliği

meslek olarak benimseyenlerin yanında askerî tarihe ilgi duyan herkese hitap eden akademik ve edebî eserler ile başvuru koleksiyonu oluşturmaya çaba sarf edeceğiz.

Tarihin tozlu raflarında unutulmaya yüz tutmuş, sandıklarda kilitli kalan hatıraların, yazma eserlerin, baskısı tükenmiş kitapların; Yükseköğretim kurumlarında büyük emekler verilerek hazırlandıktan sonra atıl kalan değerli çalışmaların gün yüzüne çıkarılması için atacağımız adımlarla, bu türdeki yayınların ve disiplinler arası müşterek akademik çalışmaların artmasında teşvik edici bir rol üstlenmek istiyoruz.

Askerlik mesleğinin ilgi sahası içinde önemli bir yer tutan yönetim, liderlik, strateji ve organizasyon konularıyla yeni modellere ilham verecek çalışmaları okurla buluşturmayı da hedefliyoruz.

Askerî geleneklerin oluşturulması, geliştirilmesi ve sürdürülmesi amacıyla özellikle tarihe mal olmuş komutan ve stratejistlerin düşünce ve tecrübelerinin sonraki nesillere aktarılmasına hizmet edecek biyografi ve hatıratlarının yanında tenkit ve kritiklerini yayınlamayı amaçlıyoruz.

Harp tarihinin konuları dışında kalan ancak yazarı veya işlediği konu itibarıyla daha çok sosyal tarihin ve edebiyatın alanına giren eserlerin yayınlanmasının da önemli bir boşluğu dolduracağına inanıyoruz.

Her safhasını akademik bir titizlikle takip edeceğimiz, editörlük çalışmalarına önem vereceğimiz yayınlarımızda Türk Dil Kurumunun Yazım Kılavuzu'nda belirtilen esaslar çerçevesinde hareket edeceğiz.

Faydalı olabilmek niyet ve gayretiyle...

PREFACE

The nature of conflict in the 21st century is undergoing a profound and rapid change. As traditional military paradigms collide with burgeoning digital domains, the boundaries between war and peace, soldier and civilian, and physical and cognitive battlefields continue to blur.

The Second War and Peace Studies Congress (WAPSCON-2025) was held amid shifting global security dynamics and brought together military experts, policymakers, and academics to examine the emerging lessons of modern warfare. This congress has collected insights from 48 presentations across 12 specialized sessions, offering a comprehensive analysis of recent conflicts, from Ukraine to Gaza.

A central theme underscored throughout the Congress is that contemporary military effectiveness can no longer be measured solely by technological superiority or numerical mass. Instead, the modern battlefield demands adaptability, cognitive flexibility, and organizational learning. As highlighted by the participants, learning from these conflicts is not merely an academic exercise but a foundational step toward international peacebuilding. The findings detailed in briefings and the Congress's final report explore the convergence of traditional operations with new frontiers in cyberspace, space, and artificial intelligence. The findings address critical operational challenges, including the dilemma of drone-versus-drone warfare, the necessity of command center survivability in a transparent battlespace, and the logistical strain of high-intensity attrition. Furthermore, they emphasize the enduring importance of the human element—leadership, mission command, and the ethical responsibility to protect civilian lives amidst the automation of violence.

As we navigate an era of “subthreshold competition” and algorithmic complexity, the “technological treadmill” requires states to move beyond static bureaucracies. This book also provides actionable policy recommendations to foster “learning ecosystems” that link academia, the defense industry, and national planning. Ultimately, WAPSCON-2025 reaffirms that in the 21st century, victory—and the subsequent maintenance of a sustainable peace—will belong not only to those who innovate first, but to those who learn and adapt the fastest.

CONGRESS PROGRAMME

DAY-1 (23 OCTOBER 2025)

OPENING SESSION: JOINT WEBINAR – MICROSOFT TEAMS

23 OCT 2025 Thursday 10.00-11.30

Welcome Speech: Oktay BİNGÖL–(Rtd.) Brigadier General, Prof. Dr.,
Congress
Chairperson

Keynote Speech: (Rtd). General Ergin SAYGUN

Preliminary Presentations

WEBINAR-A

SESSION-1 (12.00-13.15): WAR AND POLITICS IN THE 21ST CENTURY

Moderator: Nazım ALTINTAŞ–(Rtd.) Lieutenant General

Presentations

Analysis of The Politics of Russo-Ukrainian War Through the Lens of Clausewitz

Talha Çağman–National Defense University, War Studies Master's Student/Türkiye

The Dimensional Changes of the Battlefields within the Historical Context

Cumhur Erentürk-(Rtd.) Colonel, Researcher/Türkiye

Harnessing the Power of Space in the Ukraine Conflict: Strategic and Operational Lessons

İnci Sökmen Alaca–Prof.Dr., Researcher/Türkiye

Geopolitical Lessons from Turkey's Strategic Success in Syria: Lessons for India's Défense and Security Policies

Faisal Banna M.–PhD Scholar, Pondicherry University/India

SESSION-2 (13.45-15.00): OPERATIONAL LESSONS IN THE 21ST CENTURY WARS

Moderator: Tahir BEKİROĞLU–(Rtd.) Lieutenant General, Dr.

Presentations

The Role of Airborne and Air Assault Operations in Modern Conflicts

Kosar Khazaei Poul–Master Student, Allameh Tabatabai University/Iran

How Does Hamas Benefit from its Web of Tunnels?

İbrahim Karataş–Assoc. Prof., Turkish Airlines

Where Science and Tactics Meet – A Comprehensive Guide to Improving Close Quarter Battle Training for German Conventional Police Units

Lea Bug–George C. Marshall Center for European Security Studies, Germany

The Dimensions of the Battlefields in Russia-Ukrainian War

Cumhur Erentürk–(Rtd.) Colonel, Researcher/Türkiye

SESSION-3 (15.15-16.30): COMMAND-CONTROL-COMMUNICATION COMPUTER AND INTELLIGENCE

Moderator: Haldun SOLMAZTÜRK–(Rtd.) Brigadier General, Dr.

Presentations

New Command and Control System in Light of Multi-Domain Operations Concept: Battle NET

Eray Ekin–Exercise/War Gaming SME, CNK Global A.Ş.

Ahmet Berat İlhan –Military Information System SME, HAVELSAN

**Command and Control Challenges in Multi-Domain Operations
(MDO)**

Suat Dönmez–(Rtd.) Brigadier General, Assoc. Prof, İstanbul Topkapı University/Türkiye

**The Evolution of the Long Horizon Integrated Maritime Surveillance
System-**

Strategic Advance from the Homeland to the Blue Waters

Mesut Özel–(Rtd.) Rear Admiral, Assist. Prof., Kent University/Türkiye

**AI-Driven Target Detection and Identification System for Military
Combat Vehicles**

Using Decision Support Matrix

Reşat Ali Tütüncüoğlu–Lead Trainer for C4ISR Systems, HAVELSAN
Selda Güney-Assoc. Prof., Başkent University

WEBINAR-B

**SESSION-1 (12.00-14.45): 21. YÜZYIL SAVAŞLARINDA İSTİH-
BARAT VE MANEVRA**

Oturum Başkanı: Hüsmen AKDENİZ–(E) Tümgeneral, Dr.

Sunumlar

**İstihbarat Çalışmalarında Karşı İstihbarat ve Milli İstihbarat
Teşkilatı'nın İKK
Faaliyetleri**

Mustafa Tayfun Üstün–Doç. Dr., Atatürk Üniversitesi
Ömer Özger -Yüksek Lisans Öğrencisi, Atatürk Üniversitesi

Savaşlarda İstihbarat Faaliyetleri ve Alınan Önlemler Üzerine İnceleme

Mertkan Mert–Yüksek Lisans Öğrencisi, Kocaeli Üniversitesi

**Geleceğin Savaşlarında Kuvvet Çarpanı Dronlar: Rusya-Ukrayna
Savaşı Vakası**

Mehmet Alkanalka–Dr. Öğr Üyesi, İstanbul Rumeli Üniversitesi

**Hibrit Savaş/Hibrit Harekât Ortamında Muharebe Sahasının
Tahayyülü ve Alınacak Dersler**

Metin Sağsak–Dr.

**İnsanlı ve İnsansız Takım (Manned–Unmanned Teaming–MUM-T)
Konseptinin**

Değişen Harekât Ortamındaki Rolü ve Gelecek Perspektifi

Hasan Çifci–Dr., HAVELSAN

Mehmet Altun–(E) Hv.Uçk.Bkm.Kur.Alb

Manevra Karma Sınıf Harekâtın Planlamasında Harekât Hızı

Levent Köse–(E) Tuğgeneral

**Savaşın Geleceğine Bir Bakış ve Ukrayna-Rusya Savaşında Tank ve
Zırhlı Araçlar Bakımından Alınan Dersler**

Murat Kaymakçılar–(E) Albay, Savunma Havacılık ve Uzay Enstitüsü
Derneği

Yapay Zekâ ve Caydırıcılık: Bir Senaryo

Özkan Kantemir–Dr., HAVELSAN

Altan Özkil–Dr., Atılım Üniversitesi

Günümüz Kentlerin Çatışma Alanlarına Dönüşmesi

Fatih Tümlü–Dr., Jandarma ve Sahil Güvenlik Akademisi

**SESSION-2 (15.15-16.30): 21. YÜZYIL SAVAŞLARINDA DENİZ
VE HAVA**

HAREKATIYLA İLGİLİ TESPİTLER

Oturum Başkanı: Nihat KÖKMEN–(E) Korgeneral

Sunumlar

Yeni Nesil Hava-Hava Angajmanları: Pakistan-Hindistan Örneği

Hüseyin Fazla–(E) Hv.Pl. Tuğgeneral, Dr., STRASAM Başkanı

Hava Harekâtında Kullanılan Elektronik Harp Teknik ve Taktik Uygulamaları: İsrail-İran 12 Gün Savaşı Örneği

Sargun Göktun–(E) Hv.Pl. Tuğgeneral

**Balistik Füze Tehdidi ve Savunması Nedir? Entegre Hava-Füze-Balistik
Füze**

**Savunmasının Unsurları ve Gereklikleri Nelerdir: İsrail-İran 12 Gün
Savaşı**

Örneği

Hakan Kılıç–Savunma Analisti

**Hava Harekâtında Kullanılan Modern Mühimmatlarda Son Yıllarda
Kaydedilen**

Gelişmeler: Ukrayna-Rusya ve İsrail-İran Savaşları Örnekleri

Oğuz Ezik–(E) Albay

Deniz Harbinin Değişen Karakteri

Hakan Ercan–(E) Tuğamiral

Entegre Hava ve Füze Savunma Mimarisinde Hava Savunma Muhriplerinin Rolü

Mehmet Gürsu-Dr.

Ayhan Salar-Dr.

DAY-2: 24 OCTOBER 2025

WEBINAR-A

**SESSION-4 (10.00-11.15): ARTIFICIAL INTELLIGENCE AND
TECHNOLOGY IN THE 21ST CENTURY WARS**

Moderator: Ali Bilgin VARLIK–(Rtd.) Colonel, Assoc. Prof.

Presentations

**Redefining the Earth: GPS, GLONASS, GALILEO, BeiDou, and
Fergani in Global
Navigation Systems**

Mahmut Can Özdemir–PhD Student, Yalova University

**Evaluation of the Role of Artificial Intelligence in Shaping Peace in Re-
gional
Conflicts in West Asia**

Parham Pourramezan–PhD, University of Tehran, Iran

**Weaponization of Fake News: Battle of Narratives, War Medias, and
Media Wars in
the Case of 2025 Indo-Pakistani Tensions**

Farzan Safari Sabet–PhD Student, University of Tehran

Maziar Mozaffari Falarti–Assist. Prof., University of Tehran

**SESSION-5 (11.30-12.45): COMBAT SERVICE SUPPORT-LOGIS-
TICS**

Moderator: Alpaslan ERDOĞAN–(Rtd). Lieutenant General

Presentations

Logistics in Modern Warfare: Lessons from the Russia-Ukraine War

Bülent Durgun–Assoc. Prof., İstanbul Arel University

Logistics Lessons from 21st Century Wars: Sustainable Logistics: The Example of the Afghanistan War

Ahmet İlbaş–Assist. Prof., İstanbul Arel University

Hakan Kaya–Assist. Prof., İstanbul Arel University

Lessons from 21st-Century Wars with a Focus on Energy (Case Studies: Ukraine

and the Second Nagorno-Karabakh War)

Rahmat Hajimineh–Assoc. Prof., Islamic Azad University, Tehran

Ebrahim Rezaei Rad–PhD Student, Azad University, Tehran

SESSION-6 (14.30-15.45): HUMAN SECURITY IN THE 21ST CENTURY WAR ZONES

Moderator: Selma ŞEKERCİOĞLU BOZACIOĞLU–Assist. Prof.

Presentations

Humanitarian Considerations in 21st-Century Warfare: Challenges and Solutions in the Era of Advanced Technologies and Asymmetric Conflicts

Samaneh Madhi–Master Student, University of Tehran

Women on the Frontlines: The Role of Female Soldiers in the Ukraine War

Deniz Kaynak–Research Assistant, İstanbul Arel University

WEBINAR-B

SESSION-3 (10.00-11.15): 21. YÜZYIL SAVAŞLARINDA SAVUN- MA PLANLAMASI VE LOJİSTİK

Oturum Başkanı: Tarık ÖZKUT–(E) Tümgeneral, Dr.

Sunumlar

Asimetrik Savaş ve Askeri Lojistik: Rusya-Ukrayna Savaşı

Serkan Pasinlioğlu–Öğretim Görevlisi, Milli Savunma Üniversitesi
Rukiye Can Yalçın–Doç.Dr., Milli Savunma Üniversitesi

Savunma Kaynak Planlaması ve Stratejik Öngörü Arasındaki İlişki
Fahri Erenel–(E) Tuğgeneral Prof. Dr., İstinye Üniversitesi

Savunma Yönetiminin Konsept Gelişimi ve Gayrinizami Harp

Serkan Pasinlioğlu–Öğretim Görevlisi, Milli Savunma Üniversitesi
Ömer Faruk İçcan–Prof. Dr., Milli Savunma Üniversitesi

**Tek Kanallı Yakın Kızılötesi Görüntülerden Transformer Tabanlı Mo-
noküler Derinlik Tahmini**

Gamze Nur Dağ–Endüstri Mühendisi, Eskişehir Osmangazi Üniversitesi
Elif Hakbilen–Endüstri Mühendisi, Eskişehir Osmangazi Üniversitesi
Sude Nisa Keskin–Endüstri Mühendisi, Eskişehir Osmangazi Üniversitesi

SESSION-4 (14.30-15.45): SAVAŞIN İNSANİ BOYUTLARI

Oturum Başkanı: Kemal DİNÇER–(E) Kurmay Albay

Sunumlar

Gazze Savaşında İki Tarafın Taktik ve Teknikleri

Ali Denizli–(E) Kurmay Albay, Prof. Dr., İstanbul Rumeli Üniversitesi

**Muharebe Sahasında Günümüz Muharebe Özellikleri de Dikkate
Alınarak**

Birliklerin Mühimmat İhtiyacı ve Karşılanması

Levent Köse–(E) Tuğgeneral

Savaşların Gizli Silâhı: Edebiyatın ve Sanatın Savaş Stratejilerine Etkisi

Glten Akgl–Filolog, Millî Eđitim Bakanlıđı

**Kitle Kaynak Kullanımı ve Kitle Fonlaması ile Savaş Alanının
Demokratikleşmesi:**

Ukrayna-Rusya Savaşı Örneđi

Cansu Ulu–Öđretim Görevlisi, Polis Akademisi Rüştü Ünsal Polis Meslek
Okulu

**21. Yzyıl Çatışmalarında İnsancıl Hukukun Sınırları: Irak ve Suriye
Örneđi**

Ayşe Miray Altay–Araştırma Görevlisi, Çanakkale 18 Mart Üniversitesi

**21. Yzyıl Savaşlarından Tretilmiş Etik ve Hukuk İçerikli Sonuçların
Çözmlenmesi**

Azize Serap Tunçer–Prof. Dr., Çankırı Karatekin Üniversitesi

**Yapay Zekâ Destekli Karar Verme Süreçlerinin Askeri ve Sivil Alanda İş
Sađlıđı ve**

Gvenliđi zerine Etkileri

Vedat Caner–Dr. Öğr. yesi, İstanbul Beykent Üniversitesi

CLOSING: 24 October 16.30-17.00

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CONGRESS CHAIRPERSON OPENING REMARKS

Dear Participants, Distinguished Guests, ladies, and gentlemen

It is my great honor and privilege to welcome you all to the International War and Peace Studies Congress 2025—organized under the theme “21st Century Armed Conflicts: Changing Dynamics and Emerging Lessons.”

We gather here, across borders and disciplines, not only to study the anatomy of war but to understand how these experiences can serve as guideposts toward a more peaceful and secure world. The very essence of this congress lies in transforming knowledge born of conflict into wisdom for the sake of peace.

In an era when hybrid wars blur the boundaries between soldiers and civilians, and technology redefines not only the battlefield but also the moral dimensions of warfare, our collective responsibility is clear: to learn, to reflect, and to ensure that the lessons of war become the foundations of peace.

Now, I would like to provide you with an overview of the flow of the two-day program.

Our first day began with the Opening Session, featuring a welcome address and an insightful Keynote Speech by General (Retd.). Ergin Saygun, whose distinguished career and profound strategic vision will illuminate our congress theme. His reflections on the transformations in warfare will remind us that while the face of war may change, its human and ethical consequences remain enduring. Following the keynote speech, you will take three briefings on some critical dimensions of 21st-century wars, lessons learned, and actions taken.

After opening sessions, the congress divides into two parallel webinars—Webinar A and Webinar B—each exploring critical dimensions of 21st-century warfare.

In Webinar A, Session 1, titled “War and Politics in the 21st Century,” scholars and experts will examine the intricate relationship between military strategy and political objectives. Presentations highlight that today’s conflicts are as much about narratives and perceptions as they are about territory or force.

Session 2 will address operational lessons from 21st-century wars. From the strategic role of airborne operations to the tactical complexity of tunnel warfare and the integration of technology in close-quarters combat, this session bridges theory and practice.

Later, in Session 3, under the theme Command, Control, Communication, Computer, and Intelligence (C4I), speakers will focus on the transformative impact of artificial intelligence, integrated surveillance, and multi-domain operations. These discussions are vital in understanding how technological superiority and situational awareness shape both deterrence and defense.

In parallel, Webinar B will feature thought-provoking Turkish-language sessions. The first, “Intelligence and Maneuver in 21st Century Wars,” examines counterintelligence, unmanned teaming, and the accelerating tempo of operations. The second, “Naval and Air Operations,” focuses on lessons from the Israel-Iran conflict, the Indo-Pakistani engagements, and modern missile defense architectures.

Our second day begins with Session 4, “Artificial Intelligence and Technology in 21st Century Wars,” which explores how cyber operations, AI systems, and unmanned technologies are reshaping both conflict and cooperation.

Session 5, focusing on Combat Service Support and Logistics, turns our attention to the backbone of every military campaign. The lessons drawn from Ukraine, Afghanistan, and Nagorno-Karabakh offer invaluable insights into sustainability, energy resilience, and strategic foresight.

In the afternoon, Session 6-“Human Security in the 21st Century War Zones-brings the discussion full circle, reminding us that beyond the machinery of war lies the human soul. Presentations on “Protection of Civilians in Gaza,” “Women in War,” and “Humanitarian Considerations in Asymmetric Conflicts” remind us that peace is not an abstract concept but a lived experience—fragile, essential, and deeply human.

Simultaneously, Webinar B continues with sessions on Defense Planning and Logistics and The Human Dimensions of War. Topics such as post-war urban reconstruction, ethical limits of humanitarian law, and the cultural reflections of warfare in literature and art bridge the analytical with the emotional, inviting us to view conflict not only through strategic but also through humanistic lenses.

THE EVOLUTION OF THE LONG HORIZON INTEGRATED MARITIME SURVEILLANCE SYSTEM: STRATEGIC ADVANCE FROM THE HOMELAND TO THE BLUE WATERS

Mesut ÖZEL¹

Abstract

The seas, which serve as the arena for global and regional political and economic power struggles, are becoming increasingly important for monitoring and controlling various activities. Previously, naval surveillance for defence purposes has developed into an operational requirement for maritime security within the scope of maritime domain awareness, covering all sea-related activities. In this process, the Turkish Navy has adapted to the changing security environment by transforming the Long Horizon Integrated Maritime Surveillance System (LHIMSS), developed initially to support battlefield surveillance in the Aegean Sea. The system was expanded to include capabilities for acquiring the “white picture” (a civilian maritime traffic overview) for situational awareness at sea—a new operational necessity. Starting with a focus on the Aegean, the surveillance system was developed to encompass all surrounding seas and the high seas where the Turkish Navy operates. Originally reliant on foreign technology for Command, Control, Communication, Computer, Intelligence, Surveillance and Reconnaissance (C4ISR), the system is evolving into a high-level, integrated system-of-systems through software and hardware development capabilities acquired by the Turkish defence industry under the Navy’s leadership, following an evolutionary procurement model.

Keywords: naval strategy, maritime security, Long Horizon, maritime surveillance, maritime situational awareness.

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Introduction to the Conceptual Dimension of the Naval Surveillance Need

A well-designed maritime surveillance and control system is crucial for tracking vessels and providing information necessary for safe navigation and efficient commercial operations, reducing risks such as accidents and environmental pollution (İnce, Ersoy, & Yıldırım, 1998, p. xii). Coastal states have a continuous interest in the movements, identities, and intentions of vessels in waters under their jurisdiction, driven by defence needs, resource protection, search and rescue, and the fight against illicit activities.

The ultimate goal of a Maritime Surveillance System, as an integral part of intelligence, is to create a recognised picture of maritime traffic, despite geographical constraints and intermittent coverage (İnce et al., 1998, p. xii). This requires detecting, classifying, and identifying contacts.

The United States led in developing the concept of Maritime Domain Awareness (MDA), which is described as “the effective understanding of anything related to the maritime domain that could influence a nation’s or region’s security, safety, economy, or environment” (Kościelski & Miler, 2007, p. 79). The International Maritime Organisation (IMO) also offers a similar definition. Essentially, MDA encompasses knowledge of factors that could impact maritime security, safety, economic interests, and environmental concerns.

NATO’s concept of Maritime Situational Awareness (MSA) is defined as “the understanding of the maritime environment—including oceans, seas, bays, estuaries, waterways, coastal areas, and ports—and of military and non-military events, activities, and conditions within and associated with that environment, as relevant to current and future NATO operations and exercises” (NATO, 2013, p. 2-S-8). While differing in scope depending on the user, MDA and MSA involve similar activities: creating a common picture of what is happening at sea. Generally, MDA is considered more comprehensive, encompassing MSA (Doorey, 2016). Naval Surveillance, a subset of battlefield surveillance, is the systematic observation of surface and subsurface naval areas using all available means to detect, characterise, and identify the movements of ships, submarines, and other vehicles (Hicks & Metrick, 2018, p. 12).

This article focuses on the concept of naval surveillance. While military and civilian surveillance use similar methodologies and technologies, mil-

itary surveillance assumes non-cooperative, potentially hostile vessels employing deceptive tactics. Fusion centres in both systems process similar contact data. However, the outputs are referred to as the “Recognised Maritime Picture” in military systems and the “Maritime Traffic Picture” or “White Picture” in civilian systems (İnce et al., 1998, p. 17).

Surveillance in the Context of Maritime Security

The Need for Surveillance in Battle and the Importance of Information

For commanders, two elements are crucial: effective weapons and the information to use them effectively (Erkaya, 1999, p. 50). The fundamental intelligence sought concerns the enemy’s location, strength, and actions. Technological advancements, increasing weapon range and accuracy, have amplified the importance of this information need.

From the age of sail to the industrial revolution, the means of detection evolved from the naked eye to radar, which allowed target detection independent of weather conditions (Sonnenberg, 1988, pp. 1-52). The introduction of guided missiles radically changed the information requirements of naval warfare (Black, 2017, p. 178). In the gun era, sensors and weapons were integrated into a single platform. With guided missiles, the organic radar range became insufficient, necessitating external reconnaissance systems and over-the-horizon targeting tactics (Rimer, 1977, pp. 42-52).

The Tactical Importance of Battlefield Surveillance

The development of guided weapons and strategic missiles launched from naval platforms necessitated centralised information provision for entire operational theatres, not just a task group’s area. This gave rise to the concept of battlefield surveillance (Erkaya, 2000, pp. 55-56). The primary aim of a surveillance system is to establish a recognised surface picture containing targets, their identities (friend/foe, type), and movements. It uses active devices such as radars and passive devices such as Electronic Support Measures (ESM) and optical systems. A critical subsystem is “data fusion” (Erkaya, 2000, pp. 55-56). Automatic Target Recognition systems using vast databases are crucial for classification and identification (İnce et al., 1998, p. xiii).

An integrated surveillance system maintained in peacetime allows for economical tactical picture generation and the identification of enemy patterns, providing vital warning indicators (Erkaya, 2000, p. 58). Such systems are “force multipliers,” enabling the effective use of limited, expensive weap-

ons by ensuring they are directed against the most critical targets (Oxford Essential Dictionary of the U.S. Military, 2001). The benefits extend beyond war, including support for sovereignty enforcement, smuggling prevention, search and rescue, and environmental protection.

In contemporary warfare, success depends on possessing both the weapon and the target information. Neglecting information systems development carries a heavy cost. In a battle between equal forces, possessing such systems can be decisive (Erkaya, 2000, pp. 58-59).

The Operational Need for Maritime Reconnaissance and Surveillance

Cold War Era Maritime Surveillance Needs

During the Cold War, the Turkish Navy's surveillance capabilities were limited to its NATO-assigned operational area. Radar stations were established along the Black Sea and the Turkish Straits from the 1950s to the 1980s to monitor the Soviet Union. Following the Navy's strategic orientation towards the Aegean and Eastern Mediterranean, radar stations were set up to cover approaches to naval bases in those regions (Tunaboğlu, 2008, p. 77). Some stations were closed as the threat perception changed.

The Changing Concept of Naval Warfare and Guided Missiles

After the 1974 Cyprus Peace Operation, the Turkish Navy better grasped its reconnaissance and surveillance vulnerabilities in the Aegean Sea. The entry of guided missiles into both Turkish and Greek inventories fundamentally changed naval warfare concepts (Orkunt, 1969). Effective weapon range surpassed organic detection range, creating a need for external assets for over-the-horizon targeting.

Conversely, in the late 1970s, Greece turned the geographical dispersion of its Aegean islands into an advantage by establishing a radar surveillance network integrated with air and naval assets, providing operational and tactical advantages (Döğüt, 2020, pp. 48-59). This system could provide target data to dispersed missile boats and land-based batteries, threatening Turkish naval access to the Aegean.

To address this vulnerability, the Turkish Navy initiated a pre-feasibility study in the early 1980s for an integrated surveillance system in the Aegean, called the "Aegean Surveillance Project." It involved installing radars at key points, data links, and using submarines and ESM. However, this project stalled due to insufficient support (Örnek, 2016, pp. 52-57).

Post-Cold War Surveillance Needs

In the early 1990s, Navy Commanders emphasised the importance of advanced reconnaissance and C4ISR systems as force multipliers. Admiral Güven Erkaya, prioritising intelligence verification following the lessons of the TCG Kocatepe incident, restarted efforts to address reconnaissance needs. This initiative became the “Long Horizon” project, officially launched with the approval of its Project Definition Document in October 1990 (Uzun Ufuk Proje Grubu, 1997, pp. 3-9). The project’s goal was defined as “providing target information for the long-range HARPOON guided missile” (Örnek, 2016, p. 52).

Admiral Erkaya explained the Aegean surveillance to President Süleyman Demirel in 1993, who directed its timely completion. As Force Commander, Erkaya detailed the project’s scope, describing it as a force multiplier requiring a software centre and trained personnel (NAFO, 1997, pp. 6-13). He stated it aimed to “create a full, recognised surface picture in real-time for effective crisis management and for long-range missile platforms to use their weapons effectively” (NAFO, 1997, pp. 6-13). The project’s implementation phase officially began with a Defence Industry Executive Committee decision in June 1996 (S&H, 2000, p. 70).

Planned to be completed over 9 years, the project had 4 phases. Initially managed by ITU-SAM, the Navy established a special unit, the Research and Development Department (APGE). Due to problems, the Navy took over project responsibility in December 1997. The Software Development Centre (YAZGEM), later reorganised as the Research Centre Command (ARMERKOM), was tasked with software development. After this change, the project design was comprehensively reviewed, incorporating the LINK-11 concept, and the tender process was restarted with a two-year delay (Örnek, 2016, pp. 52-54).

Admiral Salim Dervişoğlu defined the project’s aim as establishing a reconnaissance, surveillance, and information exchange system to create and maintain a recognised tactical picture (Kutluhan, 1998, pp. 50-58). He indicated an “Evolutionary Procurement Model” would be applied, with three phases: 1. Core Capability; 2. Enhanced Configuration; 3. Final Configuration, allowing for risk management and technological adaptation (Kutluhan, 1998, pp. 50-58). The project was an early example of network-centric capability (Kutluhan, 2006, pp. 50-59).

The Initial Long Horizon Integrated Maritime Surveillance System

The system was designed to deliver real-time tactical imagery and target intelligence to missile platforms and commanders. It included Maritime Patrol Aircraft (MPA), coastal surveillance radars, UAVs, High-Frequency (HF) radars, ESM systems, fusion centres, and communication links (Uzun Ufuk Proje Grubu, 1997; İnce et al., 1998, pp. 10-17).

MPAs were a key element, equipped with diagnostic radars, modern ESM, and LINK-11. Coastal radar sites with classification capability and ESM were planned. HF radars would provide long-range, lower-resolution coverage for persistence. UAVs were planned for later stages. Regional and main fusion centres would filter and fuse data. Data transmission would use the military integrated communication system (TAFICS) and LINK-11 for air and surface units. The resulting picture would be shared via naval and armed forces command control systems (Uzun Ufuk Proje Grubu, 1997).

Aerial Surveillance: Evolution from Maritime Surveillance Aircraft to Maritime Patrol Aircraft

The MELTEM project aimed to acquire MPAs. After accidents grounded the S-2 Tracker fleet in 1993, the Navy sought new aircraft. Options like second-hand P-3Bs were considered but rejected due to high costs. The jointly produced CN-235 was another option. Ultimately, creating a modern Anti-Submarine Warfare (ASW) capable MPA fleet was prioritised. To maintain pilot proficiency, seven TB-20 aircraft were procured in 1995.

The General Staff questioned if the Air Force's AWACS project could meet the Navy's needs, leading to numerous briefings justifying the Long Horizon project's necessity, initially framed around maximising missile range (Örnek, 2016, pp. 52-54).

The MELTEM project, targeting 16 MPAs, was planned in three stages. MELTEM-I involved procuring six MPAs for the Navy and three Maritime Surveillance Aircraft for the Coast Guard. CN-235-100M aircraft were delivered between 2001 and 2003 without mission equipment for initial service. MELTEM-II involved structural modifications and integration of the AMASCOS 300 mission system by Thales. The ten LHIMSS aircraft were reconfigured as MPAs, with their equipment also covered under MELTEM-II. MELTEM-III was initiated for this integration.

The MELTEM-II contract faced delays, leading to penalties. In nego-

tiations, financial penalties were offset by waiving the capability to launch depth charges, limiting the aircraft to carrying two Mk46 torpedoes. Deliveries were completed between October 2013 and December 2014 (Ariş & Sünnetçi, 2011, pp. 11-37).

For MELTEM-III, the platform was changed to the more powerful ATR-72/600. The contract was revised to include eight aircraft (six MPA, two general-purpose). Certification delays occurred, and the project was completed in March 2023.

The entry into service of the P-72 aircraft, with higher speed, endurance, LINK-16 capability, modern Mk-54 torpedoes, and greater sonobuoy capacity, significantly enhanced the Navy's ASW effectiveness, extending its reach across the Eastern and Central Mediterranean (Sünnetçi, 2021, p. 24). National projects are underway to equip these aircraft with anti-surface missiles, and plans exist to replace their mission system with the national ADVENT MARTI Combat Management System (TSKGV, 2025).

The management of the prolonged MELTEM projects was criticised within defence circles, including the challenges of maintaining two different MPA platforms and the delays leaving aircraft without mission equipment for extended periods (Ariş, 2003, p. 7). Platform selection was influenced by industrial engagements and bilateral relations (Özel, 2021, p. B-33). Dr. Sıtkı Egeli noted that the Navy's requirements shifted towards the traditional MPA role focused on ASW, which favours turboprop engines, rather than the long-endurance, high-altitude flight characteristics better suited by jet engines for broad-area maritime surveillance, potentially indicating a move away from the original "Blue Waters" strategy (Özel, 2021, p. B-92). Recently, the Navy has stated its aim to acquire jet-powered MPAs under a "New Generation Maritime Patrol Aircraft Project," aligning with the "From the Blue Homeland to the Blue Waters" orientation (Alemdar, 2021).

The UAV Component

The LHIMSS concept included fixed-wing UAVs for reconnaissance. Rotary-wing UAVs on platforms were also planned. A plan to acquire Heron UAVs from Israel in 2005 was altered when the General Staff decided that medium- and high-altitude UAVs would be under Air Force responsibility, supporting other services as needed (Mönch TR, 2006, pp. 100-103). Consequently, the Heron system entered inventory in 2010 but was deployed primarily for counter-terrorism, limiting Navy access (Kutluhan, 2012, p. 14).

The Navy gained UAV capability through a 2017 leasing contract for Anka Block-B systems. Subsequently, new UAVs, such as the Aksungur and Bayraktar TB2, were integrated. As of February 2025, the Navy's inventory includes eight Anka-B/S, three Aksungur, and 19 Bayraktar TB2 UAVs (Tanış, 2024). Future concepts include AI-enabled swarming munitions/kamikaze drones and satellite communication links for UAVs (Sünnetçi, 2021, p. 14).

Long Horizon System in Practice

A prototype system developed by ARMERKOM was tested during a Black Sea ASW exercise on April 9, 2002, and more comprehensively during the Sea Wolf-2002 exercise. These trials, using ships to simulate land-based radars, identified shortcomings that contributed to system improvement (Örnek, 2016, p. 52).

Maritime Situational Awareness: The Expanding Long Horizon

Post-9/11, maritime security and MSA gained global priority. The Turkish Navy initiated the "Black Sea Harmony (BSH)" operation in 2002, which later became a regional maritime security initiative involving riparian states (Dz.K.K., 2004). To support BSH, radars at key stations were renewed, and Automatic Identification System (AIS) integration was added. A BSH Permanent Coordination Centre was established to share the "white picture" with participants and NATO.

Following the activation of the Baku-Tbilisi-Ceyhan pipeline in 2006, the Navy launched the "Mediterranean Shield Operation" (MSO) to ensure energy security and deter threats. Its scope was expanded due to regional developments, including unauthorised drilling in Cyprus's EEZ and increased foreign activity in the Eastern Mediterranean (Özgen, 2013, pp. 101-114). A Surveillance Coordination Centre was established in Mersin in 2007, with the renewal of radar sites featuring AIS. Radar coverage was extended with stations in Northern Cyprus and Kaş. The MSO is coordinated with NATO operations, and a recognised maritime picture is maintained using naval assets, MPAs, and UAVs (Karahanoğlu, 2007, p. 80). Efforts continue for multinational participation (Gürdeniz, 2020).

Consequently, the LHIMSS, initially focused on the Aegean and Cyprus approaches, evolved to cover all potential Turkish maritime jurisdiction areas and beyond. A central fusion centre, the Surveillance Coordination Centre,

was established in Izmir to manage and disseminate the recognised maritime picture.

Long Horizon and “White Picture” Interaction

Post-9/11, the Navy took a leading role in integrating MSA projects from other military and government agencies into a single “white picture.” The LHIMSS architecture was redesigned to manage this integration. Data from civil authorities like the Gemi Trafik Yönetim Sistemi (GTYS - Vessel Traffic Management System), including AIS and Long-Range Identification and Tracking (LRIT), the Ministry of Agriculture’s Balıkçı Gemileri İzleme Sistemi (BAGİS - Fishing Vessel Monitoring System), and the Coast Guard’s coastal radar systems were integrated (UAB, 2024; TOB, 2016). The Navy uses Long Horizon software to fuse data from all stakeholders and distribute it on a need-to-know basis to national and international partners.

The Turkish Navy also joined initiatives such as the Italy-led Virtual Regional Maritime Traffic Centre & Trans-Regional Maritime Network (V-RMTC & TRMN) for unclassified information sharing, and the US-led Maritime Safety and Security Information System (MSSIS) (Marina Difesa, 2025). Through multilateral cooperation, the Navy extended its MSA capacity beyond its immediate area of interest, aiding in the compilation of a real-time recognised maritime picture (Dz.K.K., 2015, p. 29). Integrating MPAs and UAVs with satellite links allows the compiled picture to be shared with naval assets worldwide.

The LHIMSS is listed as a force multiplier in the 1997 “Towards the Blue Waters” strategy (Dz.K.K., 1997, p. 6). The 2015 Naval Strategy emphasises continuous development of MSA capabilities through LHIMSS, the GENESIS/ADVENT Combat Management System, and network-enabled command and control (Dz.K.K., 2015). The nationally developed ADVENT system, with variants for surface ships (GENESIS), submarines (MÜREN), and air platforms (MARTI), provides enhanced command and control. The ADVENT UFUK system is envisioned as the future backbone of a modernised LHIMSS, tailored for maritime security and MSA (HAVELSAN, 2024).

Parallel to advances in the Turkish defence industry, components of the Long Horizon architecture can now be developed nationally. Turkish firms successfully integrated French SURICATE radars. System maintenance uses a performance-based logistics model. University-industry collaboration on

data fusion R&D continues (Aksaray, 2020, p. 75). Plans include replacing radars with domestic systems, such as ASELSAN's ARES ESM, and deploying a Mobile Coastal Surveillance System to enhance resilience and coverage (Kolukısa, 2020).

Conclusion

In summary, the expansion of the LHIMSS coverage area parallels the Navy's increasing operational radius and strategic orientation towards the blue waters. Initially focused on the Aegean Sea and approaches to Cyprus, coverage expanded to the Black Sea and Eastern Mediterranean with the BSH and MSO operations. Participation in counter-piracy operations in the Gulf of Aden and Horn of Africa brought the Indian Ocean into its scope. Subsequently, coverage has extended from the Mediterranean to the Indian and Atlantic Oceans, and recently, to the Arctic Circle during NATO exercises. Essentially, the LHIMSS's geographical expansion aligns with the Navy's strategic shift "From the Blue Homeland to the Blue Waters."

This success is built upon years of knowledge, infrastructure, and human resources developed under the Long Horizon project, guided by the Navy's "Towards the Blue Waters" strategy. This strategy's emphasis on institutionalising R&D, focusing on national software/hardware development, and involving defence industry partners from the outset has been a visionary initiative, leading to systems like GENESIS/ADVENT. Finally, as agreed by the admirals and defence experts interviewed, the Long Horizon project has not only met operational surveillance needs but has also broadened the Navy's strategic thinking, truly expanding its horizons.

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