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INSIDE THE LION'S FURY

THE LESSONS LEARNED FROM THE CONFLICT IN THE MIDDLE EAST

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INSIDE THE LION'S FURY: THE LESSONS LEARNED FROM THE CONFLICT IN THE MIDDLE EAST

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LIST OF ABBREVIATIONS

AARGM – Advanced Anti-Radiation Guided Missile
AESA – Active Electronically Scanned Array
AFST – Air Force Special Tactics
AIS – Automatic Identification System
ALCM – Air-Launched Cruise Missile
AMRAAM – Advanced Medium-Range Air-to-Air Missile
AoO – Area of Operations
AoR – Area of Responsibility
APKWS – Advanced Precision Kill Weapon System
ARG – Amphibious Ready Groups
ASCM – Anti-Ship Cruise Missile
ASW – Anti-Submarine Warfare
ATACMS – Army Tactical Missile System
ATO – Air Tasking Order
ATR – Automatic Target Recognition
AWACS – Airborne Early Warning and Control System
A2/AD – Anti-Access/Area Denial
A5K – Advanced 5K Penetrator
BDA – Bomb Damage Assessment
CAP – Combat Air Patrol
CEP – Circular Error Probable
CEW – Cyber-Electronic Warfare
CIWS – Close-In Weapon System
CoG – Center of Gravity
C-RAM – Counter-Rocket, Artillery and Mortar
CSAR – Combat Search and Rescue
CSG – Carrier Strike Group
C2 – Command and Control
C2BMC – Command and Control, Battle Management and Communications
DAS – Distributed Aperture System

DEWS – Direct Energy Weapon System
DIB – Defense Industrial Base
EOTS – Electro-Optical Targeting System
ESSM – Evolved SeaSparrow Missile
EW – Electronic Warfare
FAC – Fast Attack Craft
FARP – Forward Arming and Refueling Point
FLIR – Forward Looking InfraRed
FPV – First Person View
F2T2EA – Find, Fix, Track, Target, Engage, Assess
GEOINT – Geospatial Intelligence
HARM – High-speed Anti-Radiation Missile
HDBT – Hard and Deeply Buried Targets
HEU – Highly Enriched Uranium
HIMAD – High to Medium Air Defense
HIMARS – High Mobility Artillery Rocket System
HVT – High Value Target
IADS – Integrated Air Defense System
IAF – Israeli Air Force
IAMD – Integrated Air and Missile Defense
IBCS – Integrated Battle Command System
IDF – Israel Defense Forces
IR – InfraRed
IRGC – Islamic Revolutionary Guard Corps
IRGCN – Islamic Revolutionary Guard Corps Navy
IRIN – Islamic Republic of Iran Navy
IRST – InfraRed Search and Track
ISR – Intelligence, Surveillance and Reconnaissance
ISTAR – Intelligence, Surveillance, Target Acquisition, and Reconnaissance
JADC2 – Joint All-Domain Command and Control
JASSM – Joint Air-to-Surface Standoff Missile

JDAM – Joint Direct Attack Munition
JSOW – Joint Stand-Off Weapon
JTL – Joint Target List
LACM – Land Attack Cruise Missile
LCS – Littoral Combat Ship
LOAC – Law of Armed Conflict
LRASM – Long Range Anti-Ship Missile
LUCAS – Low-Cost Uncrewed Combat Attack System
MALD – Miniature Air-Launched Decoy
MANPADS – Man-Portable Air Defense System
MaRV – Manouverable Re-Entry Vehicle
MASINT – Measurement and Signature Intelligence
MCM – Mine CounterMeasures
MEU – Marine Expeditionary Unit
MOP – Massive Ordnance Penetrator
MRBM – Medium-Range Ballistic Missile
MSS – Maven Smart System
OoB – Order of Battle
OWA UAV – One-Way Attack Unmanned Aerial Vehicle
PrSM – Precision Strike Missile
RoE – Rules of Engagement
RTL – Restricted Target List
SAM – Surface-to-Air Missile
SAR – Synthetic Aperture Radar
SatCom – Satellite Communication
SBIRS – Space-Based Infrared System
SEAD/DEAD – Suppression and Destruction of Enemy Air Defenses
SHORAD – Short-Range Air Defense
SIGINT – Signal Intelligence
SLAM-ER – Standoff Land Attack Missile-Expanded Response
SM – Standard Missile
SRBM – Short-Range Ballistic Missile

SSGN – Ship Submersible Guided Nuclear

TEL – Transporter Erector Launcher

THAAD – Terminal High Altitude Area Defense

TSA – Target System Analysis

USCENTCOM – United States Central Command

USCYBERCOM – United States Cyber Command

USSPACECOM – United States Space Command

USV – Unmanned Surface Vessel

UUV – Unmanned Underwater Vehicle

VBSS – Visit, Board, Search, and Seizure

VHF – Very High Frequency

VSHORAD – Very Short-Range Air Defense

WSO – Weapons Systems Office

INTRODUCTION

On Saturday, February 28, 2026, the Israeli Air Force (IAF) and the components of U.S. Central Command (USCENTCOM) deployed within its Area of Responsibility (AoR) launched a large-scale coordinated military action against the Islamic Republic of Iran, marking the opening of a massive air campaign and long-range targeting effort. The campaign, the result of long-term planning conducted in close coordination between the two military establishments, was structured around two distinct but convergent initiatives: Operation *Roaring Lion*, conducted by the IAF, and Operation *Epic Fury*, coordinated by USCENTCOM. Although formally separate, the two operations formed a strategically unified whole, the product of tactical and doctrinal synchronization that established their operational complementarity at every stage of execution. From the outset, the two operations were also characterized by a strong multi-domain dimension, revealing unprecedented complexity both logistically and conceptually. The close integration between USCENTCOM and the IAF outlined a new paradigm of power projection, based on the construction of a common and fully interoperable operational environment. Within this context, elements such as advanced logistics, missile defense, Electronic Warfare (EW), Intelligence, Surveillance, and Reconnaissance (ISR) capabilities, aerial refueling, naval pre-positioning, and the resilience of land-based infrastructure did not play a merely ancillary or supporting role, rather, they functioned as essential enabling factors for the entire maneuver. The most significant feature of Operations *Epic Fury* and *Roaring Lion* lies precisely in this structural interdependence among operational dimensions that may appear distinct: the awareness that superiority in the physical domain is inseparable from the ability to orchestrate, in real time and with extreme precision, the entire support architecture that makes its exercise possible. Particularly

relevant in this regard was the ability to sustain a constant and high sortie rate in a theater extending over more than 1.6 million square kilometers. From this standpoint, the decisive element was not so much the sheer number of platforms mobilized, but rather the ability to transform that mass into a distributed, coherent, and persistent combat system. Within this ecosystem, the employment of a variety of highly specialized assets has been proven critical, acting as genuine enablers of kinetic maneuver. For example, the use of the *RC-135V/W Rivet Joint* reconnaissance aircraft has been essential for strategic Signals Intelligence (SIGINT), operating continuously along the margins of Iranian airspace to map electromagnetic emissions and provide early warning of ballistic missile launches, while feeding the coalition's target validation process with the collected data. Moreover, during the operations, the employment of Airborne Early Warning and Control Systems (AWACS), such as the *E-2 Hawkeye* and the *E-3 Sentry*, was also fundamental. They ensured continuous surveillance and tracking of the attack campaign's targets, while providing crucial support to air defense. At the same time, the coherence of the combat system was also ensured by Airborne Communication Relay assets, such as the *E-11A BACN* or the *EQ-4B*, which enabled connectivity among aircraft equipped with different datalinks. This function, consistent with Joint All-Domain Command and Control (JADC2) doctrine, was proven decisive in allowing fifth-generation *F-35 Lightning II* fighters to exchange data with fourth-generation platforms, such as *F-16 Fighting Falcons* and *F/A-18 Super Hornets*, within low-observable corridors and despite intense adversary electronic interference.



Figure 1 – Representation of an F-15E Strike Eagle escorting an E-3 Sentry AWACS aircraft.

Support to maneuver and the persistence of airborne assets were then ensured by a massive fleet of more than 160 aerial refueling tankers, including *KC-135 Stratotankers* and *KC-46 Pegasus* aircraft, which represent the core of *Air Mobility Operations*. The centrality of these platforms, without which deep targeting conducted by *B-2 Spirit* strategic bombers and *F-35 Lightning II* multirole fighters could not have taken place, was tragically highlighted by the incident of March 13, 2026, when a *KC-135* directly engaged in aerial refueling operations crashed in Western Iraq, causing the loss of all six crew members. Finally, to complete the logistical projection architecture, *C-17 Globemaster III* and *C-130J Super Hercules* aircraft played a significant role by ensuring both strategic and tactical airlift. These assets transported heavy munitions and critical components for *MIM-104 Patriot* and *Terminal High Altitude Area Defense (THAAD)* systems from the United States and Europe to regional hubs in Kuwait and Qatar, while *C-130* aircraft were used for rapid refueling of forward bases. In this framework, the integration of newly conceived one-way attack drones, such as the *Low-Cost Uncrewed Combat Attack System (LUCAS)*, has also made it possible to saturate Iranian air

defenses at limited cost, asymmetrically replicating the attritional logic typical of *Shahed*-family systems.



Figure 2 – A B-2 Spirit bomber engaged in aerial refueling with a KC-135 Stratotanker.

On the Israeli side, Operation *Roaring Lion* represented the culmination of a process of capability strengthening and doctrinal adaptation developed through the plurality of military engagements conducted by the Israel Defense Forces (IDF) after the attacks of October 7, 2023. It constituted the full maturation of a trajectory already visible in previous campaigns, from those in the Gaza Strip, Lebanon, Syria, and against Yemen, to Operation *Rising Lion*, during which the application of the *Joint Targeting Cycle* was progressively refined. Increasingly effective operational sequences were thereby consolidated, initially centered on Suppression and Destruction of Enemy Air Defenses (SEAD/DEAD), before shifting attention to the neutralization of Command and Control (C2) centers and, lastly, to the targeting of critical infrastructure. This pattern has been decisive for the overall effectiveness of the campaign, which was marked from the very beginning by extremely intense operational rhythms. In the first

days, the IAF employed approximately 200 aircraft, that dropped more than 2.000 munitions and struck more than 500 targets. In this context, within the first 100 hours more than 7.000 flight hours were accumulated, more than 550 aerial refueling operations were conducted, and more than 750 targets were hit. By March 25, Israel claimed to have carried out more than 3.000 strikes. In this context, the most significant figure is the number of aerial refueling operations recorded in the first 100 hours, which shows that distance and persistence were not merely operational variables, but structural factors fully integrated into planning. Operation *Roaring Lion* should not be seen as a simple aggregation of raids, but as the convergence point of an overall restructuring of the Israeli way of fighting, made operationally credible by massive U.S. logistical support, itself enabled by a widespread military presence across the Middle East.

From an infrastructural standpoint, U.S. military bases in the Persian Gulf operated as a hierarchical and functionally differentiated network: Muwaffaq Salti (Jordan) as a forward hub; Prince Sultan (Saudi Arabia) as a C2 and air-support node; Al Udeid (Qatar) and Ali Al Salem (Kuwait) as transit and logistical support hubs, with additional capabilities distributed at Shaikh Isa (Bahrain). Within this system, also the Diego Garcia base, in the Indian Ocean, performed a central staging, rearming, and maintenance function for strategic bombers. However, the Iranian missile attack of March 21 against that same base highlighted a crucial point: the logistical rear area is now an integral part of the battlespace and can no longer be considered as a secure hub. It follows that logistics is increasingly less a support function and more an intrinsic component of maneuver. Therefore, the ability to generate and sustain the rhythm of operations depends directly on the resilience, distribution, and protection of the logistical system. In this sense, the role of distributed logistics emerges clearly: the network of bases employed does not operate as a collection of static nodes,

but as a dynamic and redundant system capable of absorbing shocks and ensuring operational continuity even in the presence of attacks against rear areas. From this perspective, the protection of logistics becomes a central element in all its forms, from missile defense to the strengthening of infrastructure and lines of communication and must be considered from the earliest stages of operational planning. A further aspect concerns the temporal dimension. Maintaining a high sortie rate requires continuous synchronization among refueling, maintenance, and ammunition flows; time therefore becomes an operational variable through which logistics determines the continuity of maneuver.

This architecture found full expression in the naval dimension, which has been proven equally decisive. The deployment of two Carrier Strike Groups (CSGs) guaranteed an autonomous capacity to generate effects, integrating fires, sensors, and logistical support within and from the maritime domain. At the same time, operations aimed at preventing mine emplacement in the Strait of Hormuz highlighted how the maritime space was treated as a contested operational environment in which freedom of navigation had to be actively guaranteed. Once operations had begun, this component was joined by an amphibious and land device that suggested the construction of joint forcible entry options, later not implemented, both on Iranian territory and in the littoral-insular theater within the Persian Gulf. Concurrently, the use of land systems such as *M142 High Mobility Artillery Rocket Systems* (HIMARS) in an anti-ship role highlighted the shift toward a logic of cross-domain fire, one of the clearest indicators of the multi-domain nature of the operations. Overall, the coalition succeeded in implementing a sustained targeting campaign in which air superiority and refueling capacity ensured operational continuity. The multi-domain character of *Epic Fury* and *Roaring Lion* lies precisely in the fact that logistical enablers became an integral part of maneuver, becoming themselves combat factors. This analysis aims to examine the

operations and the *modus operandi* that emerged in this context, considering not only the military activities conducted by the United States and Israel, but also those implemented before and during the hostilities by the Islamic Republic, in order to derive lessons learned useful for interpreting the evolution of contemporary multi-domain warfare.



Figure 3 - M142 HIMARS asset launching an ATACMS missile.

1. THE TARGETING CAMPAIGNS: *EPIC FURY*, *ROARING LION*, AND *TRUE PROMISE IV*

The multi-domain nature of Operations *Epic Fury* and *Roaring Lion* finds its most concrete validation in the analysis of the targeting campaigns that formed their executive core. It is in this dimension that the integrated architecture between USCENTCOM and the IAF was translated into measurable operational sequences, targets struck, resources consumed, and vulnerabilities exposed: a plan in which logistical and technological enablers ceased to be abstract categories and became determining factors for the outcome of the maneuver. Considering this, the present section aims to examine separately, notwithstanding their inseparable interdependence, the three components that animated the battlespace: the U.S. targeting campaign, the Israeli targeting campaign, and the Iranian retaliation. The first two expressed, each according to its own doctrinal and capability specificities, a common logic based on inter-domain synchronization and on the use of an accelerated kill chain to neutralize the adversary's Centers of Gravity (CoGs), beginning with C2 nodes and extending to Hard and Deeply Buried Targets (HDBTs). The third component, the Iranian operation *True Promise IV*, introduced a variable of the opposite sign: that of a near-peer competitor which, while foregoing technological parity, turned mass saturation and economic attrition into instruments of resistance, forcing the coalition to confront the limits of the industrial sustainability of its stand-off munitions.

1.1. The U.S. Targeting Campaign

Operation *Epic Fury* was conceived as a multi-domain campaign aimed at destroying the Islamic Republic of Iran's missile capabilities, nuclear program, and military-industrial complex. To

this end, an integrated force was employed, composed of several types of combat aircraft, including fifth-generation stealth assets (*F-22 Raptor* and *F-35 Lightning II*) and strategic bombers (*B-1B Lancer* and *B-2 Spirit*), operating according to the standardized six-phase action chain known as F2T2EA (Find, Fix, Track, Target, Engage, Assess) commonly referred to as the kill chain. It should be clarified, however, that the term F2T2EA refers specifically to the dynamic targeting process, namely the management of targets that emerge directly during the conduct of operations. The campaign, however, integrated also a broad deliberate targeting component for pre-planned fixed targets. Overall, the targeting campaign developed in accordance with the Joint Targeting Cycle, the doctrinal process governed by Joint Publication 3-60 (JP 3-60), through which U.S. forces identify, develop, and prioritize targets to be struck. Within this cycle, the Target System Analysis (TSA) began with the Target Development and Prioritization phase, during which USCENTCOM conducted a systematic analysis of the adversary's Order of Battle (OoB) through multi-source data fusion. This activity integrated the capabilities of the *Maven Smart System* (MSS), a military AI platform developed by Palantir capable of correlating more than 150 heterogeneous information sources, including satellite imagery, SIGINT data, drone feeds, and ground-sensor networks, with traditional ISR assets such as specialized aircraft like the *RC-135V/W Rivet Joint*, tasked with collecting intelligence related to the electromagnetic spectrum. This combination made it possible to characterize the nodes of Iran's Integrated Air Defense System (IADS), as well as to map underground missile production and storage sites, including, for example, the Isfahan and Khojir complexes.



Figure 4 – RQ-180 drone overflying Iranian territory during a dynamic targeting activity.

Overall, the analysis enabled the identification not only of the physical coordinates of adversary CoGs, the nodes from which the Iranian military command derived its warfighting capacity and freedom of action, but also of the structural vulnerabilities of individual bunkers. In this specific case, the principal CoGs were identified in the Islamic Revolutionary Guard Corps' (IRGC) mobile missile capability, the integrated C2 network, and the infrastructure of the nuclear program. Once identified, the targets were placed on the Joint Target List (JTL) and subsequently on the Restricted Target List (RTL) according to the applicable Rules of Engagement (RoE). The RTL, it should be emphasized, does not exclude targets from engagement, but imposes *ad hoc* constraints on them, such as limitations on collateral damage, time windows to be respected, authorized types of munitions, or higher-level approval requirements. In parallel, the Capabilities Analysis phase was also carried out, during which the most appropriate munition was selected for each target. Against the deepest and most heavily

protected underground facilities, such as larger missile complexes, 900-kilograms *GBU-31(V)3/B Joint Direct Attack Munitions* (JDAMs) were employed by *B-2 Spirit* bombers, with the aim of exploiting their deep-penetration characteristics to reach structures otherwise inaccessible to conventional ordnance.

At the same time, U.S. doctrine required each target to undergo a two-part process of vetting and validation. Vetting is the procedure through which the accuracy of the information supporting target identification is assessed, confirming that the target is located where estimated and that its functional characterization is correct. This procedure is conducted continuously throughout the target development cycle and ends with a community assessment of the validity of the designated target. Validation, by contrast, ensures that the target constitutes a legitimate military objective, verifying its compliance with current RoEs and with the principles of the Law of Armed Conflict (LOAC). Target prioritization is therefore subject to continuous review based on weather conditions, intelligence updates, and the evolution of the operational picture. The specific case of Iranian Transporter Erector Launchers (TELs) represented the most emblematic example of the tension between deliberate targeting and dynamic targeting during *Operation Epic Fury*. IRGC TELs typically operate according to the so-called shoot-and-scoot tactic: the launch vehicle exits the tunnels of the so-called “missile cities” (underground complexes dug into the mountainous areas of Western and Central Iran and capable of housing missiles, TELs, support systems, and C2 facilities), reaches a launch position, executes the firing sequence, and then re-enters the tunnel in extremely short order, thereby reducing its window of vulnerability. From this point of view, solid-propellant missile systems (*Sejjil*, *Kheibar Shekan*, and *Fattah-1*) are particularly problematic because they do not require on-site fueling operations and can therefore be transported, erected, and launched within minutes. Liquid-propellant systems (*Shahab-3*, *Ghadr*, *Khorramshahr*, and

Qiam), by contrast, require between 30 and 60 minutes for propellant loading, during which the TEL and support vehicles remain stationary and vulnerable to ISR acquisition. This asymmetry influenced Iranian employment patterns during the initial phases of the conflict, which saw a concentration of liquid-propellant system launches within time windows perceived to have lower surveillance coverage.



Figure 5 – A TEL returning into the tunnel of an underground missile city after launching its missile.

Overall, the campaign to neutralize TELs conducted by Israeli-U.S. forces resulted in an estimated 90 percent reduction in the Iranian missile-launch rate during the first week of operations. In the initial days of the conflict, the Islamic Republic had launched approximately 350 missiles per day, a figure that fell to roughly 50 by the seventh day. In this regard, the conceptual distinction between deliberate targeting and dynamic targeting is essential. Deliberate targeting, which concerned fixed targets known in advance, such as the production complexes of Isfahan, Khojir, Shahroud, and Parchin, was characterized by detailed planning, in-

depth target development, optimal munition selection, and the assignment of pre-coordinated attack windows within the Air Tasking Order (ATO) cycle. Nevertheless, a significant challenge for deliberate targeting concerned the resilience of Iranian underground infrastructure, which proved partially resistant even to high-yield penetrating munitions. Dynamic targeting, by contrast, dominated the hunt for mobile TELs, because it is the optimal process for engaging targets that are not identified, scheduled, or anticipated during deliberate planning, but that emerge or are detected during operations. Even in that regard, however, the IRGC's tactical response had an important impact and evolved during the conflict to make its operating procedures less predictable, including the use of launch units from improvised positions.

Overall, the targeting operation was structured into different attack waves, each characterized by a specific doctrinal objective aimed at dismantling Iranian defensive and offensive systems within the first 72 hours. It should be noted, however, that the labels Alpha, Bravo, and Charlie are an analytical categorization adopted for explanatory purposes, consistent with doctrine and with the operational phases documented by available open sources but not attested as official operational nomenclature in USCENTCOM public communications.

1.1.1. The First Wave: Alpha

The first wave, designated Alpha, aimed to conduct SEAD/DEAD activities by blinding long-range radars and subsequently neutralizing Iran's IADS. In this context, for the conduct of the offensive, coordination between U.S. Space Command (USSPACECOM) and U.S. Cyber Command (USCYBERCOM) was fundamental. On one side, USSPACECOM conducted offensive space electronic warfare operations to jam adversary satellite

links, strategically isolating C2 nodes. On the other, USCYBERCOM simultaneously infected those nodes with malware to delay the response of Surface-to-Air Missile (SAM) systems. In parallel, the use of *EA-18G Growlers*, operating from U.S. aircraft carriers at distances compatible with the still highly contested airspace during the first hours of the conflict, made it possible to dominate the electromagnetic spectrum through stand-off jamming. These activities saturated Iranian radar receivers with electronic interference designed to prevent lock-on against attacking assets. They also forced Iranian operators to increase signal power or change radar frequencies, making their precise positions easier to identify through the passive sensors of deployed assets.



Figure 6 – EA-18G Growler in flight during a stand-off jamming activity.

In this framework, however, Iran's ability to conceal TELs inside underground bunkers made launcher vetting less effective than expected. This was also because non-geostationary military satellite systems cannot ensure permanent coverage over specific coordinates, enabling Iranian forces to bring TELs out of tunnels, conduct launches, and withdraw them again without being identified. For this reason, extensive use of *MQ-9 Reaper* and *RQ-180* drones became necessary, enabling persistent monitoring of

areas deemed critical for potential mobile-launcher employment. Unlike the *RC-135V/W Rivet Joint* ISR aircraft, which operates at the margins of contested airspace, the *RQ-180* can fly directly over targets in denied areas thanks to its stealth characteristics. Although the specific operational capabilities of the *RQ-180* remain largely classified, available information and the known characteristics of the platform make it plausible to attribute to it Measurement and Signature Intelligence (MASINT) and very-high-resolution imagery collection capabilities, both consistent with its documented employment profile.

In addition, within this degraded electronic environment, the U.S. launch of *ADM-160 Miniature Air-Launched Decoys* (MALDs) acted as a catalyst for dynamic targeting by simulating the radar signatures of combat aircraft. In this way, MALDs forced Iranian SAM batteries, including *S-300* systems, to shift from passive alert to active radar emission, revealing their geographic coordinates and allowing U.S. forces to complete the targeting chain through the launch of munitions such as the *AGM-154 Joint Stand-Off Weapon* (JSOW). Stand-off weapons of this kind, exploiting inertial navigation and the radar signal emitted by the enemy, were widely used to destroy critical components of Iranian SAM batteries, effectively completing the transition from electronic suppression to kinetic neutralization.

It is important to note, however, that the Islamic Republic created significant problems for U.S. forces through the use of low-cost thermal decoys, consisting of heat sources such as stoves or engines placed near inflatable radars, capable of simulating the thermal signature of real systems and generating target overload as a product of the fog of war. This tactic, widely documented in the Russian-Ukrainian conflict and subsequently adopted by several regional forces, including the Islamic Republic of Iran, forced Israeli-U.S. pilots to fly *F-35 Lightning II* aircraft at low altitude in order to discriminate real radars through the *Electro-Optical*

Targeting System (EOTS) and Distributed Aperture System (DAS), slowing the effectiveness of the attack, increasing exposure to enemy fire, and raising fuel consumption. In addition, several Iranian structures were equipped with roof apertures designed to allow ballistic missiles to be launched without the launchers exiting the facilities, further extending the threat spectrum.

The result of the measures adopted by Iranian forces was an extension of the Kill Chain Model, reducing the overall efficiency of the targeting campaign. To counter Iran's systematic use of thermal decoys, Israeli-U.S. forces adopted multi-sensor fusion techniques, integrating data from multiple heterogeneous sensors to distinguish real targets from replicas. In practical terms, this approach involved long-endurance ISR platforms such as the *RQ-180* to detect residual physical indicators, such as tire tracks on the ground, absent in the case of decoys, as well as Synthetic Aperture Radar (SAR) to identify structural characteristics and electromagnetic signatures typical of real systems, which are difficult to replicate. Once the precise electromagnetic footprint was identified, *AGM-88E Advanced Anti-Radiation Guided Missiles (AARGMs)* were primarily employed, designed to lock onto and follow the radar-signal source even if the adversary switched off the antenna to conceal it. It should be noted, however, that intense Iranian GPS disruption reduced the accuracy of satellite-guided munitions and forced coalition assets to favor inertial and laser-guided navigation, increasing time on station over targets and raising the risk profile.



Figure 7 – F-35 Lightning II and F-22 Raptor aircraft flying over Iranian territory after conducting a SEAD/DEAD activity.

At a practical level, the kinetic phase of the initial attack particularly involved *F-35 Lightning II* aircraft, which operated to establish corridors of local control, and *EA-18G Growlers* armed with *AGM-88E AARGM anti-radiation missiles* and *ALQ-99 electronic warfare pods*, which systematically suppressed Iranian acquisition and fire-control radars, opening gaps in IADS coverage. Once partial suppression was achieved within the first 24 hours of the operation, the U.S. operational assessment determined that the IADS had been sufficiently degraded to allow escorted penetrations by other assets, including *F/A-18 Super Hornets*, *F-15E Strike Eagles*, and *F-16 Fighting Falcons*. These aircraft continued to employ *AGM-88E AARGM* and *AGM-88 High-Speed Anti-Radiation Missile (HARM)* weapons extensively, while *F-22 Raptor* assets provided protection by neutralizing any Iranian air threats.

A fundamental component was also the introduction of *LUCAS* drones, used in swarms to saturate Iranian radars and destroy low-priority targets, allowing more expensive vectors to be preserved for critical IRGC infrastructure. During the first wave, coalition forces also made extensive use of *MQ-9 Reaper* drones armed with *AGM-*

114 *Hellfire* missiles for precision strikes against short-range air-defense sites and, later, against IRGC C2 centers and mobile drone and missile launch platforms that posed an imminent threat. Overall, the objectives of the first attack wave were achieved through the coordinated and synergistic use of the full spectrum of aerial capabilities fielded by the Israeli-U.S. coalition. This result was instrumental in creating reduced-threat corridors that subsequent waves could use to penetrate Iranian territory with significantly lower risk of engagement.

1.1.2. The Second Wave: Bravo

The second wave, designated Bravo, aimed to disrupt the IRGC C2 apparatus in Tehran and satellite-communication nodes through the use of *BGM-109 Tomahawk* Land-Attack Cruise Missiles (LACMs), GPS-guided JDAM munitions, and, according to what can be reconstructed from available sources, although with some uncertainty given the system's gradual drawdown in the U.S. Navy, *AGM-84H/K Standoff Land Attack Missile-Expanded Response* (SLAM-ER) Air-Launched Cruise Missiles (ALCMs). JSOW munitions were also used during this phase for stand-off attacks, while *RC-135V/W Rivet Joint* aircraft continued to provide constant SIGINT to map Iranian attempts at reorganization. All of this was supported by *KC-135 Stratotanker* and *KC-46 Pegasus* aerial tankers, which sustained fighters in flight and extended their endurance. In this context, *EC-130H Compass Call* and *EA-37B Compass Call II* electronic warfare assets played a decisive role by preventing the transmission of orders from IRGC headquarters to missile batteries distributed across the country.

During this phase, however, critical problems emerged in the execution of Bomb Damage Assessment (BDA), especially in estimating the degree of degradation of Iranian C2 infrastructure located in deeper fortified underground installations. This

generated a significant intelligence gap in the overall assessment of the operational effects achieved. Indeed, technical intelligence-collection capabilities have been proven insufficient to confirm with adequate reliability either the neutralization of senior IRGC personnel or the actual destruction of installations and arsenals, allowing only verification of external structural damage to targets without providing probative evidence of the destruction of the assets inside them. As a result, the coalition had to conduct re-strike operations against the same targets already hit, a dynamic consistent with analyses of the uncertain effects produced by Operation *Midnight Hammer* in June 2025 against deeper installations, and one that led to a suboptimal expenditure of available munitions.



Figure 8 – Targeting of an Iranian C2 center.

1.1.3. The Third Wave: Charlie

The Charlie wave began on the fourth day of the war, consistent with the D+4 munitions transition from stand-off missiles and

munitions to direct precision strikes over Iranian territory, made possible by earlier SEAD/DEAD campaigns and the disruption of the IRGC C2 apparatus. This phase focused on targeting interdiction, namely the degradation of solid-propellant production lines, underground nuclear facilities at Parchin, Khojir, and Isfahan, and underground missile depots. Given the serious damage that either destroying these complexes or, alternatively, “bottling them up” by destroying their access points would have caused the Islamic Republic, the “missile cities” were treated as priority targets, together with C2 capabilities. In this regard, the United States outlined a solution aimed at addressing the problem of weapons production at its source, striking infrastructure dedicated to drone and missile production as well as distribution centers for critical components, including smuggled Western engines and integrated circuits. It should be emphasized, however, that Iranian production was not eliminated but only slowed, because many micro-factories remained outside the target list for legal reasons. In this environment, characterized by a highly degraded air defense and a fragmented C2 apparatus, U.S. forces were able to employ *B-52H Stratofortress*, *B-1B Lancer*, and *B-2 Spirit* strategic bombers. Because these aircraft can carry substantial quantities of GPS-guided JDAM free-fall munitions including bunker-buster variants such as *GBU-31s* equipped with the 900-kilograms *BLU-109* warhead, *GBU-28s* equipped with the 2.200-kilograms *BLU-113* warhead, *GBU-72 Advanced 5K Penetrators (A5K)* equipped with the 2.300-kilograms *BLU-138* warhead, as well as more general-purpose munitions such as *GBU-38s* with a 250-kilograms warhead, they conducted direct attacks on key targets. In this context, bomber payload capacity was especially important. For example, *B-2 Spirits* can carry up to 16 *GBU-31* JDAMs, whereas tactical combat aircraft such as fighters are limited to a few units. The ability to transport significant quantities of such munitions proved decisive because these weapons can compromise or

collapse bunker entrances without resorting to *GBU-57A/B Massive Ordnance Penetrators* (MOPs). The latter, weighing approximately 13.600 kilograms overall, including 2.423 kilograms of explosive, can penetrate up to 60 meters of generic material, such as earth or rock, or approximately 18 meters of standard reinforced concrete before detonation; because of their size, they can be carried only by the *B-2 Spirit*, which can carry a maximum of two per sortie. By comparison, the *GBU-28* can penetrate roughly 30 meters of earth or 6-7 meters of reinforced concrete. It can also be launched by multirole fighters such as the *F-15E Strike Eagle*, giving it greater tactical flexibility and enabling more rapid employment. Together with the *GBU-72*, it was used to neutralize C2 bunkers and tactical ammunition depots at lesser depths, where the use of a strategic bomber would have been disproportionate.



Figure 9 – A B-2 Spirit bomber heading toward its target during a targeting mission.

In addition to bombers, *F/A-18 Super Hornets* were also employed, focusing on medium infrastructure targets through the extensive use of JDAM and JSOW munitions against IRGC depots and missile sites, while *AGM-158 Joint Air-to-Surface Standoff Missiles*

(JASSMs) were launched against TELs. The continued use of LUCAS systems was also observed for strikes against secondary targets such as barracks and fuel depots. Overall, the targeting validation phase continued throughout the operation precisely because of the constant movement of targets on both land and sea. To this end, USCENTCOM employed ISR platforms such as the *U-2S Dragon Lady*, which operated in the stratosphere to provide persistent coverage of the area through SIGINT, MASINT, and Geospatial Intelligence (GEOINT), proving decisive both for BDA and for directing new strikes.

In parallel, the United States also degraded coastal sensors with the dual objective of preparing the arrival of the CSG within range of Iranian anti-ship missiles and preventing inland air-defense assets from providing early warning to the Iranian navy. To this end, U.S. forces used *RQ-180* and *MQ-9 Reaper* drones to map emissions from *Ghadir* coastal radars, while USCYBERCOM conducted cyberattacks by infecting data-transmission nodes between coastal radar sites and *Noor* and *Qader* missile batteries. Subsequently, coalition ships and fighters, receiving data from drones, launched stand-off missiles, supported by *P-8A Poseidon* aircraft for tactical coordination. Between March 6 and April 1, U.S. Joint Forces focused on the threat posed by IRGC Fast Attack Crafts (FACs) and explosive naval drones, conducting dynamic targeting against swarms of small boats attempting to lay naval mines. To carry out these activities, U.S. command relied on *A-10 Thunderbolt II* aircraft and LUCAS systems, which intercepted FACs before they could reach firing distance from naval units. The munitions used included *RIM-162 Evolved SeaSparrow Missiles* (ESSMs), which have a secondary anti-surface capability, as well as *Long Range Anti-Ship Missiles* (LRASMs). The final phase concerned the degradation of the submarine threat and supporting infrastructure. Anti-submarine warfare (ASW) was conducted by *Arleigh Burke*-class destroyers and by Unmanned Underwater Vehicles (UUVs)

capable of mapping the seabed in real time in areas where the Islamic Republic had positioned mines. The U.S. campaign against the Iranian navy ultimately reaffirmed that modern sea control is not achieved solely by sinking the adversary fleet, but by neutralizing the entire land-based ecosystem of radars and C2 that sustains it, especially in a compartmentalized maritime theater.

1.2. The Israeli Targeting Campaign

The analysis of the Israeli targeting campaign against the Islamic Republic of Iran in Operation *Roaring Lion*, conducted in coordination with the United States but with distinct objectives, reveals a superior speed of execution to that of its ally and an almost total dependence on the integration of fifth-generation sensors and long-range munitions. Israel carried out a campaign focused on national survival under a preventive doctrine, eliminating tactical threats and the high-level Iranian politico-military leadership. The initial phase aimed to neutralize the Iranian radar network through a Cyber-Electronic Warfare (CEW) maneuver. To implement it, *F-35I Adir* aircraft penetrated enemy airspace, acting as ISR data-collection nodes in support of Unit 8200, which plausibly inserted corrupted data packets into Iranian C2 systems. This operation would have enabled *F-15I Ra'am* fighters to operate in stand-off mode at a safe distance from Iran's borders, employing long-range precision munitions such as *Rocks* missiles and, at the same time, decoy-assisted vectors and attack profiles to support penetration, contribute to the saturation of enemy integrated air defenses, and increase the burden on detection and engagement systems. What was surprising in this phase, however, was the high resilience of Iranian passive detection systems. Since they did not emit their own waves, they could not be detected by traditional warning systems. The solution

adopted was the use of *IAI Harop* loitering munitions, man-in-the-loop systems equipped with both a passive anti-radiation seeker and an electro-optical sensor for non-emitting targets. These systems operated over suspected areas both for persistent surveillance and for the direct engagement of identified radar sites. During the search for mobile launchers, Israeli forces, like U.S. forces, also faced the problem of target overload resulting from Iranian decoys. For this reason, a high number of expensive missiles was initially consumed, and the operational rhythm slowed. The solution involved integrating data from drones with AI-based



Figure 10 – An F-16I Sufa fighter launching a Rampage missile.

Automatic Target Recognition (ATR) software on *Rampage* missiles launched by *F-16I Sufa* aircraft, which could also remain outside the denied area. These vectors were able to distinguish real radar systems through radar and optical sensors integrated into the terminal guidance system, dramatically reducing the Circular Error Probable (CEP) and ensuring the destruction of real launchers before they could re-enter protected tunnels.

Israeli forces also concentrated on the destruction of nuclear sites and underground industrial complexes at Parchin, Khojir, and Fordow. Here, a doctrinal difference emerged compared with the U.S. approach, which prioritized deep penetration with massive

charges. Israel preferred the use of *SPICE 2000* guided munitions, compatible with *F-35I Adir*, *F-16I Sufa*, and *F-15I Ra'am* aircraft, aimed exclusively at striking the entrances of the “missile city” tunnels to seal them rather than destroy the bunkers completely. The main critical issue in this phase was the intense spoofing conducted by the Iranians, which made satellite coordinates unreliable for GPS-guided glide bombs. To address this problem, Israel exploited the electro-optical image-comparison technology of *SPICE 2000* munitions, which allows the physical identification of tunnel entrances and autonomous course correction without relying on satellite systems.

About Israeli targeting in Lebanon, it should be noted that Hezbollah was not part of the conflict from the start of Operation *Roaring Lion* on February 28, 2026. The group entered the war on March 2, four days later, launching rockets against Israel in response to the confirmation of the death of Supreme Leader Ali Khamenei and thereby violating the ceasefire mediated by the United States in November 2024. The IDF campaign in Lebanon should therefore be framed as a reactive response to this escalation and not necessarily as a component planned *ab initio* in the operation against the Islamic Republic. The IDF responded immediately with strikes on Beirut and southern Lebanon, initially employing *F-35I Adir* and *F-16I Sufa* fighters to strike Hezbollah launch sites, supported by ISR platforms such as *Hermes 900* drones for persistent surveillance and target acquisition (ISTAR – Intelligence, Surveillance, Target Acquisition, and Reconnaissance), in order to degrade the group’s fire capability and prevent counterattacks that could saturate *Iron Dome*. The campaign did not develop in strictly sequential phases; instead, strikes simultaneously hit launch sites, logistical infrastructure, weapons depots, and C2 centers, with 306 waves of attacks recorded between March 2 and March 15, 2026. Approximately 63 percent were concentrated in Southern Lebanon,

17 percent in the Beirut and Dahiyeh area, 10 percent North of the Litani, and 9 percent in the Bekaa Valley. Attention then progressively shifted to interdicting logistical flows and destroying missile depots, struck with precision-guided munitions compatible with *SPICE 1000* and *SPICE 2000*, although the specific employment of these munitions in the Lebanese campaign was not explicitly confirmed. In parallel with airstrikes, the IDF launched a ground operation in southern Lebanon, with troops operating in the Mount Dov area and South of the Litani to locate weapons depots, eliminate Hezbollah operators, and strengthen the forward defensive posture along the Northern border. Finally, Israeli forces further disrupted Hezbollah's C2 network in an action culminating on April 8, 2026, in the largest coordinated offensive wave since the beginning of Operation *Roaring Lion*: approximately 50 fighters struck more than 100 targets in ten minutes, including C2 centers in Beirut and Southern Lebanon and infrastructure belonging to missile and naval units.

1.3. The Iranian Targeting Campaign

The analysis of the Iranian targeting campaign against the Gulf Countries and Israel, designated Operation *True Promise IV*, reveals a sophisticated application of the doctrine of multidimensional saturation aimed at countering the coalition's technological superiority through asymmetric attrition and the pursuit of distributed fire resilience. The Iranian maneuver initially followed a rigid protocol of time-on-target synchronization, in which launches of different vectors were staggered in inverse order to their cruising speed to guarantee simultaneous impact on adversary CoGs. Specifically, One-Way Attack Unmanned Aerial Vehicles (OWA UAVs), generally from the *Shahed* family, were launched first because they can take hours to reach their targets; they were followed by cruise missiles, which have intermediate speed, and then by ballistic missiles, which reach supersonic speeds.



Figure 11 – A swarm of Shahed-136 drones approaching a U.S. military base.

During the initial phase of the counterattack, Iranian command employed massive swarms of low-radar-signature OWA UAVs to saturate the fire-control processors of adversary High-to-Medium Air Defense (HIMAD) systems and force an unsustainable expenditure of expensive high-end kinetic interceptors. This approach was consistent with a saturation model intended to degrade the effectiveness of adversary Integrated Air and Missile Defense (IAMD) architectures by large numbers of low-cost vectors. In this context, platforms such as the *Mohajer-6* drone appear consistent with ISTAR and light-strike functions, while the use of electronic warfare capabilities remains plausible but unconfirmed. At the same time, the massive use of *Shahed-136* OWA UAVs reflected an operational model already observed in other theaters, including the Russian-Ukrainian war, designed to maximize pressure on the lower layers of adversary layered air defense. The effectiveness of the defensive response, based on a multilayered architecture comprising kinetic interceptors and short-range systems, revealed structural limits in the penetration capacity of drone swarms. Within this framework, Iran's modification of flight profiles toward very-low-altitude trajectories

is significant, indicating a tactical adaptation consistent with terrain masking and low-observability penetration doctrines.

The second phase of the counterattack involved the use of solid-fuel ballistic vectors against High-Value Targets (HVTs). In particular, the attack on infrastructure such as the Nevatim Air Base was consistent with the objective of degrading adversary air-projection capability. The selection of targets highlighted a combination of military and infrastructural targeting, suggesting a hybrid approach aimed not only at deteriorating adversary operational capabilities, but also at generating economic and psychological pressure at the regional and international levels. The use of systems such as *Kheibar Shekan* and *Fattah-1* fit within a logic of saturation and diversification of threat profiles. The integration of Maneuverable Re-entry Vehicles (MaRVs) also reflected an attempt to increase penetration probability through evasive maneuvers in the terminal phase, in line with known countermeasures against exo-atmospheric interception systems such as *Arrow-3* missiles. Nevertheless, the overall effectiveness of these countermeasures appeared limited by the technological maturity of adversary IAMD systems, which continued to ensure high interception rates.

The final phase of the campaign focused on maritime denial in the Strait of Hormuz and the Red Sea, indicating a transition toward A2/AD strategies. In this context, the use of anti-ship cruise missiles and asymmetric systems such as FACs fit within a doctrine of irregular naval warfare. At the same time, the vulnerability of coastal launchers to adversary dynamic targeting chains required dispersion across mobile platforms and the use of hardened underground infrastructure. This configuration was consistent with Iran's mosaic defense doctrine, characterized by decentralized C2, significant tactical autonomy for units, and notable resilience of the targeting system even in the presence of heavy degradation of central C2. More broadly, Iranian targeting activities during the

conflict adopted a nonlinear and distributed cycle, in which the classical model was compressed and partially decentralized. This approach allowed Tehran to maintain continuous operational pressure even under conditions of adversary informational superiority, privileging persistence and decision-making resilience over absolute precision in individual engagements.

Overall, the operation confirmed the structural limits of a strategy based exclusively on quantitative saturation in the absence of adequate air superiority, as well as the growing effectiveness of Western IAMD architectures in neutralizing heterogeneous threats, ranging from OWA UAVs to ballistic and cruise missiles. It thereby reaffirmed the Iranian paradigm of asymmetric warfare, based on seeking the advantage in cost-effectiveness rather than in surgical precision or qualitative technological superiority. At the same time, it became clear that Iranian targeting is increasingly oriented toward systemic effects rather than the punctual destruction of individual targets, in line with a prolonged attritional strategy aimed at eroding the adversary's politico-military sustainability over the long term.

1.4. Tactical and Operational Balance

Overall, since the start of the conflict, more than 13.000 targets were plausibly struck, divided among C2 centers, IRGC headquarters, intelligence-related facilities, launch and storage sites for ballistic missiles, naval units and infrastructure, production hubs and underground depots for drones and OWA UAV systems, as well as assets linked to Iran's IADS architecture, such as radar sites and SAM batteries.

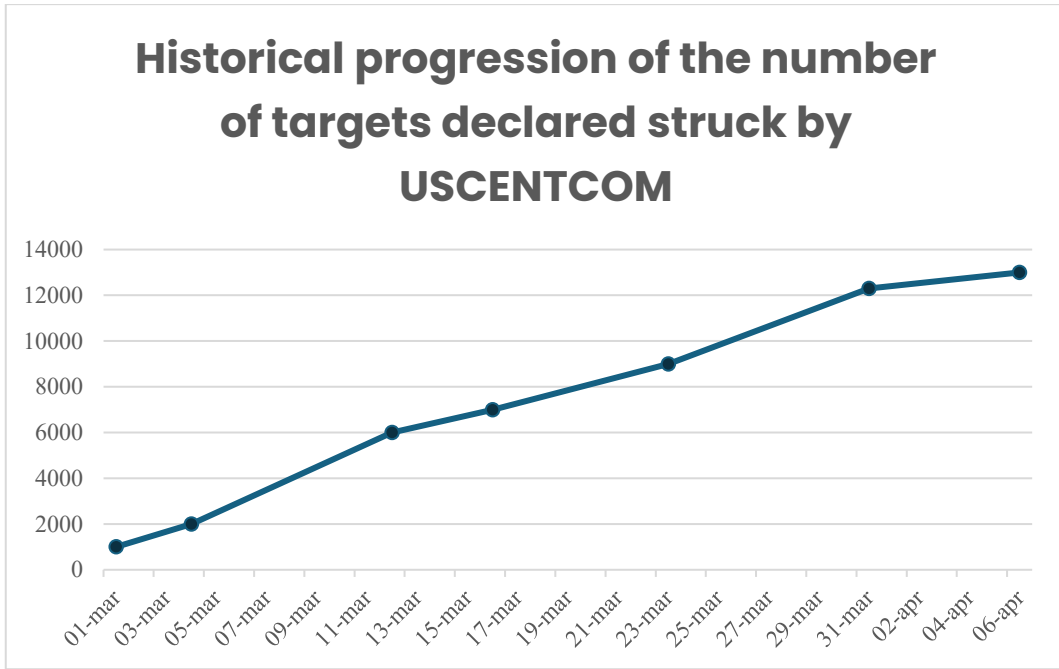


Figure 12 – Historical progression of the number of targets declared struck by USCENTCOM.

Operation *Epic Fury* destroyed approximately 80 percent of Iranian air-defense systems, more than 90 percent of the regular Iranian fleet’s naval units, and approximately 50 percent of the Fast Attack Craft of the Islamic Revolutionary Guard Corps Navy (IRGCN). At the same time, it devastated Iran’s Defense Industrial Base (DIB) through the destruction of 90 percent of weapons factories and 80 percent of the country’s nuclear industrial base. Specifically, of the 13,000 targets struck, 4,000 were dynamic targets identified during the operation. A wide variety of objectives were neutralized, including approximately 1,500 air-defense systems, 450 missile-storage facilities, 800 OWA UAV storage sites, and 2,000 C2 centers. Roughly 700 attacks were also recorded against targets connected to Iranian naval mining capabilities, degrading them by an estimated 95 percent, while more than 155 naval units were also damaged or destroyed. Among the targeting missions conducted, nearly 70 were carried out by strategic bombers, of which approximately 20 lasted more than 30 uninterrupted hours and relied intensively on aerial refueling. In this context, the number of munitions and sorties conducted was higher than prewar

expectations, largely because re-strikes were needed to verify the neutralization of critical targets, primarily the HDBT sites of Parchin, Khojir, and Isfahan.

It is now established that the initial phases of the conflict entailed significantly higher financial burdens than subsequent phases. This imbalance resulted from the massive use of sophisticated weapons, which progressively declined as the coalition achieved air superiority. The fourth day represented the tactical transition threshold, marking a shift toward more sustainable weapon systems that allowed a high level of strike accuracy to be maintained while reducing costs. By the fourteenth day of operations, stand-off munitions accounted for only about 1 percent of the total used. The targeting campaign nevertheless raised serious concerns not only because of its financial cost, with more than 850 *Tomahawks* launched by March 28, for a unit cost of approximately \$3.6 million and an aggregate expenditure of more than \$3 billion, but above all because of the limited industrial capacity for replenishment. For example, the U.S. defense budget for fiscal year 2025 provided for the purchase of only 57 *Tomahawks*, while the 2026 figure rose to approximately 110 missiles. This disproportion between wartime consumption and replenishment capacity reveals a significant vulnerability in the strategic-munitions supply chain.

By the fourth week of operations, the pace of U.S. attacks stabilized at more manageable volumes, ranging between 300 and 500 targets struck daily. The integration of cheaper short-range munitions into targeting activities made it possible to rationalize daily military spending without compromising the effectiveness of individual missions. At the same time, broader analysis of other weapon systems highlighted the foresight of U.S. investment in JASSMs: thanks to large purchases made over the previous decade, stockpiles of these long-range air-launched vectors proved to be among the largest and best suited to sustaining a

prolonged war effort. On the Israeli front, the IDF confirmed that during Operation *Roaring Lion* the IAF conducted more than 8.500 sorties, including those by AWACS, tankers, escort aircraft, and fighters, while dedicated strike sorties exceeded 1.000. The IDF also reported the use of approximately 18.000 munitions, including bombs and missiles, in roughly 10.800 strikes, hitting more than 10.700 targets, more specifically divided into 4.000 structures and 6.700 components within those structures, such as hangars or fuel depots. From an operational perspective, IDF activities highlighted a large-scale, multi-front war effort, with particular emphasis on the degradation of Iranian strategic infrastructure. In Lebanese territory, Israeli forces conducted approximately 2.500 total attacks, eliminating 130 missile launchers, 120 C2 centers, and 100 weapons depots, as well as neutralizing 7 bridges and crossings along the Litani River to sever enemy logistical lines. At the same time, the offensive extended deep into Iranian territory, where priority targets reflected the intent to destroy Tehran's long-range attack and projection capabilities. Approximately 700 sites linked to missile forces, 500 C2 centers, 450 launchers, and 150 air-defense systems, including 100 missile batteries, were struck.

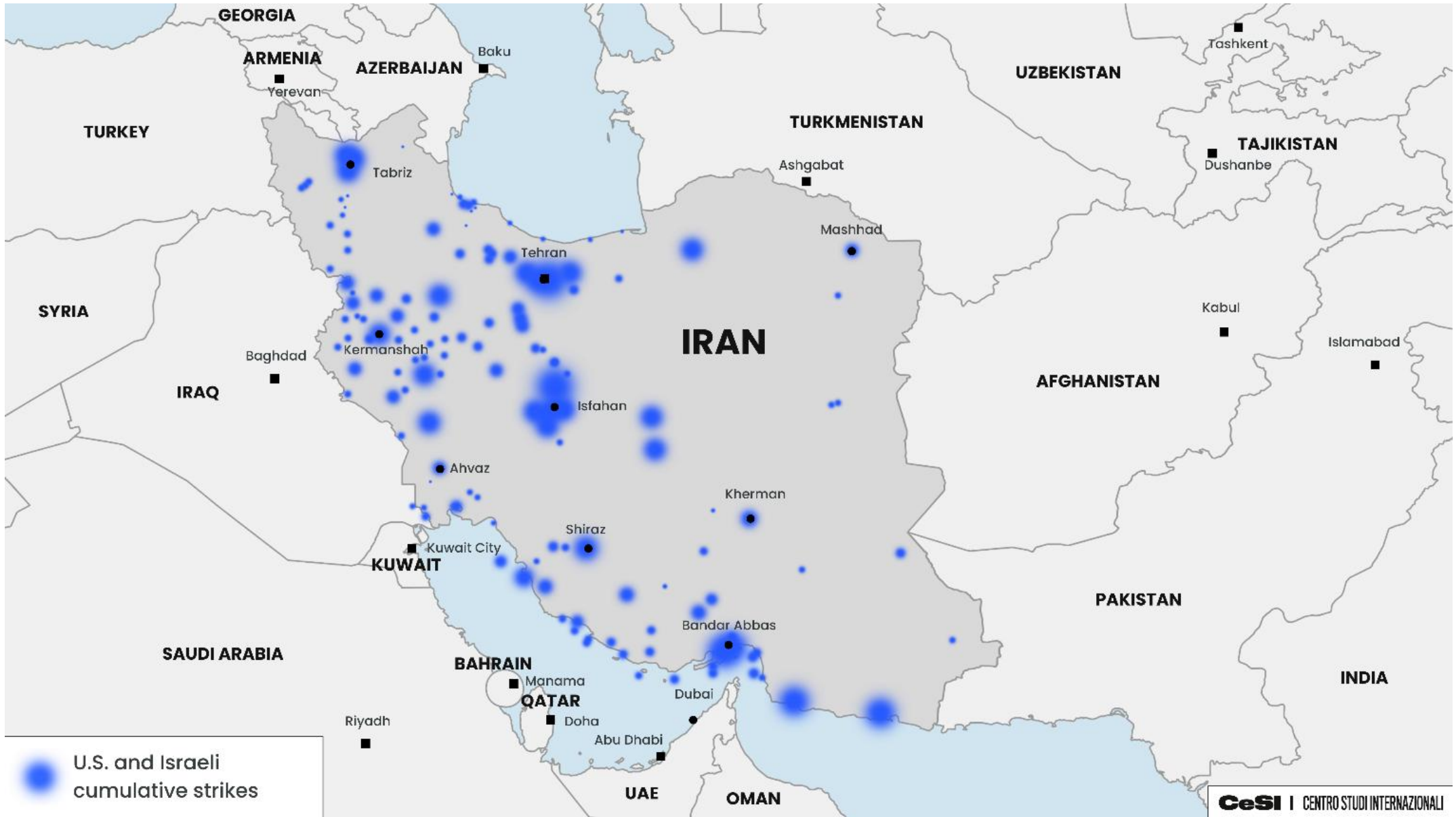


Figure 13 – Graphic representation of U.S. and Israeli attacks against the Islamic Republic of Iran.

The examination of the Islamic Republic of Iran's attack campaign against the Persian Gulf countries, by contrast, revealed a strategy of asymmetric pressure that made the United Arab Emirates the primary target of the initial phase. A dramatic attack peak occurred between February 28 and March 1, 2026, marked by more than 700 combined launches of OWA UAVs and ballistic missiles by Iran. Kuwait experienced a similar situation, suffering a massive attack of 376 vectors in the earliest days of operations, followed by more intermittent launches that intensified again in the first week of April, when unmanned-aircraft activity increased. In Saudi Arabia, the Iranian offensive remained steady, reaching peaks of 76 drones in a single day around March 20, while Bahrain faced smaller but relentless daily incursions, averaging between 10 and 40 assets per day. In parallel with Iranian activity, Hezbollah's claims produced a land and air war of attrition that reached its maximum operational effort on March 25, when almost 100 declared attacks were recorded, dominated by rocket launches and anti-tank missiles, accompanied by the growing integration of First Person View (FPV) drones and mortars. This multi-vector saturation imposed an unprecedented interception effort on regional IADS architectures, especially during synchronized peak days among the different actors of the Iranian coalition, showing a clear intent to overload the defense systems of U.S. partners in the area. The Iranian operation confirmed its hybrid nature, aimed at striking not only military centers in the Persian Gulf Countries but also at undermining the economic stability of the entire region through a strategy of attrition and strategic cost imposition.

In addition to the marked and priority offensive against civilian naval units transiting the Strait of Hormuz, with 24 confirmed specific attacks, and to the constant pressure on the 14 U.S. military bases in the region, the Islamic Republic also systematically struck several high-value civilian infrastructures. Six international airports were targeted to interrupt commercial and logistical air flows into

the area. An equivalent number of attacks targeted radar sites and satellite communications (SatCom) installations, also to degrade early-warning capabilities. The threat also extended to data centers, highlighting a willingness to isolate the Gulf Countries not only physically but also informationally. The offensive against the energy and industrial sectors proved especially insidious, with six attacks against refineries and fuel-storage facilities, three attacks against commercial ports, two against aluminum-processing plants, and two against gas extraction and distribution infrastructure, inflicting direct damage on the productive and export capabilities of the countries struck. The inclusion of four hotel facilities in the Iranian target map further underscores the intent to strike the tourism sector and generate a climate of widespread insecurity, which heavily affected perceptions of stability and security in the Gulf monarchies' urban centers.

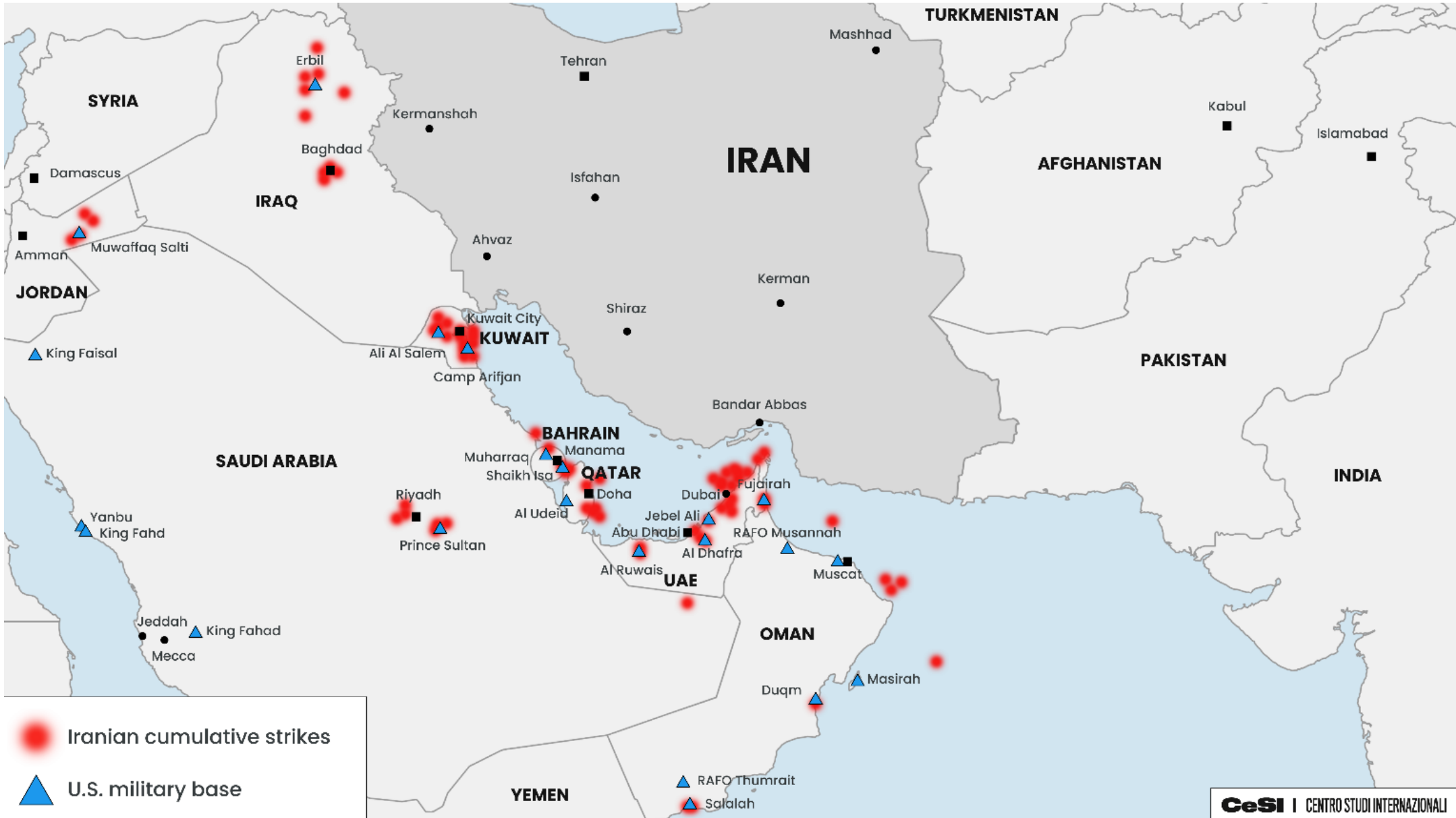


Figure 14 – Graphic representation of Iranian attacks against the Gulf Countries.

2. OPERATIONS IN THE MARITIME DOMAIN

The maritime domain represented, during Operation *Epic Fury*, one of the central strategic axes of the campaign conducted by the United States against the Islamic Republic of Iran. Although public attention focused above all on deep air strikes and on the degradation of Iranian missile and nuclear infrastructure, this domain in fact constituted the connective tissue of the entire war effort, ensuring power projection, logistical endurance, missile defense, freedom of maneuvers in the Gulf and, above all, the possibility of transforming Western technological superiority into a durable operational advantage. The centrality of the sea derived, first, from the geography of the theatre. The Strait of Hormuz, indeed, constituted not only a chokepoint for the global energy market, through which, before the Iranian closure of 28 February 2026, approximately 25% of global crude oil trade and 20% of liquefied natural gas transited, but also a strategic bottleneck within which Tehran had historically built its sea-denial posture. From this perspective, aware of the impossibility of sustaining a symmetrical confrontation with the US Navy, before the outbreak of hostilities the Islamic Republic of Iran had structured its maritime defense around a combination of asymmetric means, such as fast attack craft, naval mines, coastal anti-ship batteries, *Shahed-136*-type OWA UAVs, Anti-Ship Cruise Missiles (ASCM) and light units dispersed across several bases. By virtue of this, the operational priority of Iranian forces was not the acquisition of sea control, but rather its intermittent and local denial to adversary forces, raising the cost of the American presence in the Persian Gulf and creating the conditions for a scenario of saturation and multiple interdiction capable of making the continuation of enemy operations unsustainable. The American response was structured around the most significant naval deployment in the Middle East since Operation *Iraqi Freedom* in 2003. At the outbreak of hostilities,

Carrier Strike Group 3 (CSG-3) of the *Nimitz*-class aircraft carrier *USS Abraham Lincoln* was already operational in the Arabian Sea, with *Carrier Air Wing 9* embarked, including *F/A-18E/F Super Hornet* fighter-bombers, *F-35C Lightning II* multirole fighters for stealth penetration, *EA-18G Growlers* for SEAD/DEAD activities and *E-2D Advanced Hawkeye* AWACS aircraft. On 5 March 2026, moreover, *Carrier Strike Group 12 (CSG-12)* of the *Ford*-class aircraft carrier *USS Gerald R. Ford*, already present in the Area of Operations (AoO) in the Eastern Mediterranean at the beginning of hostilities, transited the Suez Canal and entered the Red Sea, bringing with it *Carrier Air Wing 8* with a similar composition, except for the *F-35C Lightning II* component, and comprising approximately 75 aircraft. On 23 April, furthermore, the *Nimitz*-class aircraft carrier *USS George H.W. Bush (CVN-77)* the AoR of USCENTCOM, bringing the number of aircraft carriers in the region to three, collectively capable of a sortie-generation capacity estimated at between 300 and 360 daily missions under sustained conditions.



Figure 15 – Representation of Carrier Strike Group 12.

In this context, the aircraft carriers were also accompanied by extensive escort formation. This included, first of all, 13 *Arleigh Burke*-class destroyers, of which 7 were independently deployed in the area and 6 were integrated into the two CSGs, equipped with the *Aegis* combat system and capable of launching both *BGM-109 Tomahawk* land-attack cruise missiles and *Standard Missile 2, 3* and *6* interceptors (*SM-2, SM-3* and *SM-6*). In addition, at the start of operations, three Littoral Combat Ships (LCS) equipped with the first operational Mine CounterMeasure (MCM) packages ever deployed in the theatre were present in the Persian Gulf. Finally, although the presence of at least one *Los Angeles*-class submarine in an offensive role was confirmed, it is plausible that another *Los Angeles*- or *Virginia*-class asset was also deployed in the area, as well as an *Ohio*-class submarine. The operational rear, moreover, was centered not only on the American military bases located in the Gulf Countries, but also on the air-naval base of Diego Garcia, in the Indian Ocean, which supported strategic bombers, *P-8 Poseidon* maritime reconnaissance assets and *MQ-4C Triton* drones. Finally, to complete the force projection, once operations had begun the *America*-class amphibious assault ship *USS Tripoli*, with the 31st Marine Expeditionary Unit (MEU) embarked, and subsequently the *Wasp*-class amphibious assault ship *USS Boxer*, with the 11th MEU, were directed to the area. These brought with them combat helicopters and vertical-take-off aircraft, including additional *F-35B Lightning II* multirole fighters and *V-22 Osprey* tiltrotors, with the declared objective of keeping open the option of an amphibious projection onto Kharg Island, an energy and logistical node of primary strategic importance for Iranian oil exports.

2.1. The Targeting Campaign against the Iranian Navy

The destruction of the Iranian navy was declared from the outset as one of the three priority military objectives of Operation *Epic Fury*, alongside the neutralization of missile capabilities and the demolition of the *Defense Industrial Base* (DIB) of the Islamic Republic. In this sense, the first units to open fire in the maritime domain were the US Navy destroyers, which launched *BGM-109 Tomahawk* missiles against Iranian naval forces already in the opening hours of 28 February, beginning the campaign with systematic attacks on the southern belt of the country. Among the first targets struck was the naval base of Bandar Abbas, headquarters of the IRGCN, of the 1st IRGCN Naval District responsible for the Strait of Hormuz, and of the forward headquarters of the Southern fleet of the Islamic Republic of Iran Navy (IRIN). The base was hit in the first wave and then struck again on 2 and 5 March, when several satellite images showed fires and confirmed the destruction of various buildings and several naval units at anchor. At the same time, the port of Konarak, headquarters of the 3rd IRIN Naval District on the Gulf of Oman, the IRGCN naval base of Imam Ali at Chabahar, the only Iranian port directly facing the Indian Ocean, and the base of Bushehr on the Persian Gulf were also struck. Overall, within the first 48 hours USCENTCOM declared that all 11 Iranian naval units present in the area East of the Strait of Hormuz had been eliminated from the zone.



Figure 16 – BGM-109 Tomahawk LACM being launched from an Arleigh Burke-class destroyer.

Among the units struck or sunk during the initial phase were assets of strategic importance for both components of the Iranian navy. First, the *IRIS Makran*, converted from an oil tanker into the first IRIN forward base ship capable of supporting helicopters and special forces, was struck at anchor in Bandar Abbas on 28 February, with satellite images from 2 March showing it in flames. In the same base, the *IRIS Shahid Bagheri* was also destroyed, a drone carrier converted from a container ship, equipped with a 180-meter flight deck with a take-off ramp at the bow. Entered in service with the IRGCN in February 2025, it was struck in the first hours of the operation, with confirmed impacts on the flight deck and the stern area, and although it did not sink, it is currently inoperable. Frigates of the *Bayandor*, *Alvand* and *Jamaran* classes, *Shahid Soleimani*-class corvettes (all four units of which USCENTCOM confirmed as neutralized on 11 March), IRGCN fast patrol boats, at least one *Ghadir*-class submarine and one *Kilo*-class submarine complete the picture of Iranian naval losses documented during the first two weeks of hostilities. In this framework, the historical progression of

the data on sinkings declared by USCENTCOM is of interest, as it traces a sustained and accelerated attrition curve. Indeed, while on the one hand the destruction of 9 Iranian ships was recorded within the first day, and on 3 and 4 March USCENTCOM updated the total first to 17 units plus one submarine and then to 20 units, on the other hand by 6 March more than 30 ships had been sunk or destroyed, marking the beginning of an exponential growth in the number of assets destroyed. On 9 March, after only 10 days of hostilities, the number of sunk units had risen to a total of 51, and then substantially doubled within a week, exceeding 100 ships on 16 March. Finally, by 7 April 2026, at the end of the active combat phase, the overall destruction of approximately 150 naval units belonging to 16 different classes was recorded, together with the sinking of all submarines in the Iranian fleet and the neutralization of 97% of naval-mine stockpiles.

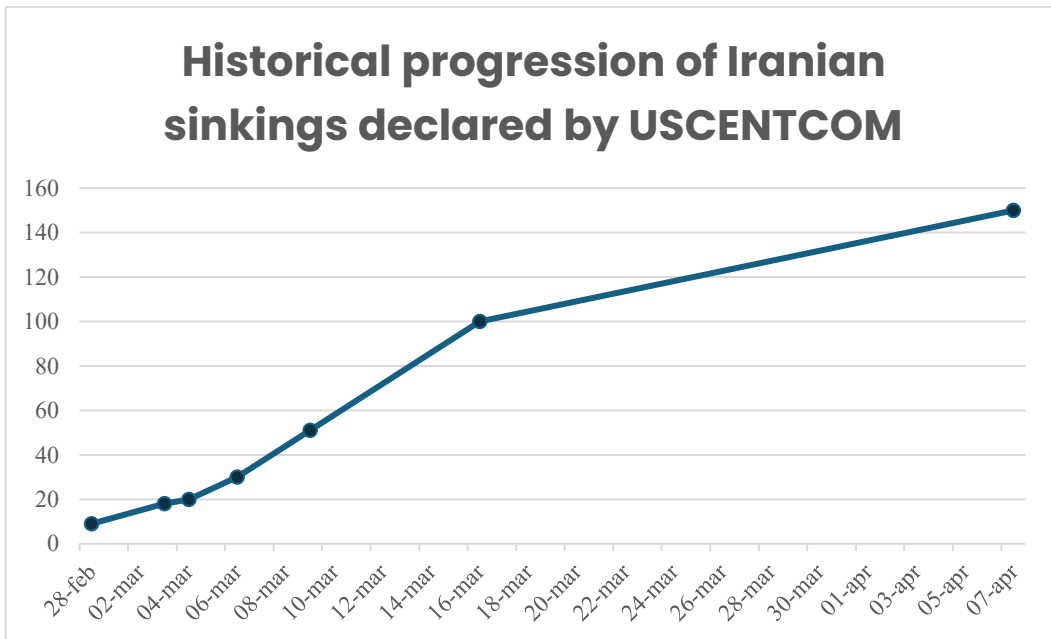


Figure 17 – Approximate graphic representation of the historical progression of Iranian sinkings declared by USCENTCOM.

The single most significant event in the naval campaign was the sinking of the *Moudge*-class frigate *IRIS Dena* on 4 March 2026 in the Indian Ocean, approximately 20 nautical miles from the Southern coast of Sri Lanka. At the time of the attack, the unit was

sailing towards the Islamic Republic after having participated in the *International Fleet Review 2026* and in the multinational MILAN exercise in Visakhapatnam, India, and was therefore lightly armed in accordance with the regulations of the event. The *Los Angeles*-class attack submarine *USS Charlotte* therefore intercepted it in international waters through the launch of two *Mk 48* torpedoes, one of which struck the stern of the frigate, causing it to sink approximately two to three minutes after impact. The episode represented the first sinking of an enemy unit by an American submarine since 1945, and the second in modern history after the destruction of the Argentinian *Brooklyn*-class cruiser *ARA General Belgrano* by the British *Churchill*-class submarine *HMS Conqueror* during the Falklands War in 1982. The episode produced a historically significant collateral consequence, as it prompted the *Bandar Abbas*-class logistics ship *IRIS Bushehr* to take refuge in the port of Colombo, where it was interned by the Sri Lankan Navy (the first case of internment of a warship in a neutral country since the Second World War) and the *Hengam*-class landing ship *IRIS Lavan* to seek refuge in the Indian port of Kochi, where it was likewise interned. Overall, the action of the *USS Charlotte* unequivocally demonstrated the American ability to project submarine power globally, intercepting and neutralizing enemy naval units thousands of kilometers from the main theatre of operations and with little warning. From a technical-operational standpoint, the naval targeting campaign displayed a distributed and inter-domain fire profile that constituted one of the most doctrinally relevant elements of the entire operation. From this perspective, *BGM-109 Tomahawk* LACMs, launched from *Arleigh Burke*-class destroyers and, possibly, also from *Ohio*-class *Ship Submersible Guided Nuclear* (SSGNs) submarines, represented the most widely used vector in the first phase to strike naval bases, coastal infrastructure and naval units in port. These were then joined by the *Mk 48* torpedoes employed in the *USS Charlotte* action against the

IRIS Dena. On the land side, the use of *M142 High Mobility Artillery Rocket Systems* (HIMARS) equipped with *Army Tactical Missile Systems* (ATACMS) and, for the first time in real combat conditions, with the new *Precision Strike Missiles* (PrSM) stands out for hitting naval targets located in port or in restricted waters, an event that marked a significant extension of the frontier of fire towards the sea. In this context, on 17 March USCENTCOM confirmed the use of *GBU-72*-type penetrating munitions against underground bunkers distributed along the Iranian coast, housing cruise and anti-ship missiles and designed to withstand traditional bombardment. In parallel, alongside the missile threat emerged the threat represented by fast attack crafts, employed in swarms by the IRGCN. To counter them, on 19 March *A-10 Thunderbolt II* aircraft were deployed in an anti-naval-swarm role in the Strait of Hormuz, armed with *Advanced Precision Kill Weapon System II* (APKWS II) laser-guided rockets, as well as with the 30 mm *GAU-8/A* cannon, and also supported by *AH-64 Apache* attack helicopters for the countering of OWA UAV assets. In this context, while on 10 March USCENTCOM communicated the destruction of 16 Iranian minelaying vessels near the Strait, the total subsequently rose to more than 30 units by 16 March. The overall set of vectors employed conveys the image of a well-structured integrated and multi-domain kill chain, in which the distinction between land, air and naval fire tended to blur and every domain contributed to countering the maritime threat.



Figure 18 – An A-10 Thunderbolt II engaged in the interception of Iranian Fast Attack Crafts.

Finally, an event of interest occurred on 19 April 2026 in the context of American maritime interdiction operations in the Arabian Sea linked to the strengthening of the naval blockade imposed against the Islamic Republic. In this context, the *Arleigh Burke*-class destroyer *USS Spruance* intercepted the Iranian cargo ship *Touska*, which had repeatedly ignored orders to stop. Following the escalation, the unit employed its *Mk 45 Mod 4* 127 millimeters naval gun to carry out precision shots against the engine room of the civilian vessel, with the objective of immobilizing it without sinking it. After the target lost propulsion, boarding teams were employed to take control of the unit and proceed with its operational seizure (VBSS – Visit, Board, Search and Seizure). The episode was relevant insofar as it constituted the first case in almost forty years in which an American warship used its naval artillery against a real target in a maritime interdiction operation, with the last previous case dating back to the 1980s, again against the Islamic Republic.

2.2. The Iranian Asymmetric Response in the Maritime Domain

The Iranian response to American operations confirmed the asymmetric and multidimensional nature of Tehran's naval posture. Already in the first hours of 28 February, the IRGCN issued warnings through Very High Frequency (VHF) radio transmissions to all ships transiting the Strait of Hormuz. On 2 March, the closure was then formalized for nations not friendly to the Islamic Republic, and on 4 March the IRGCN proclaimed full control of the Strait, allowing passage only to expressly authorized ships, mainly oil tankers bound for China and India. In this framework, Iran conducted at least 21 confirmed attacks against merchant vessels, employing three main vectors: Unmanned Surface Vessels (USVs), *Shahed*-family OWA UAV assets and anti-ship missiles launched from littoral platforms. Among the documented episodes were the use of a USV to strike, on 4 March, the oil tanker *Sonangol Namibe* anchored near the port of Kuwait City, 800 kilometers from the Strait; the sinking on 6 March of a tugboat that had gone to assist the container ship *Safeen Prestige*, which had been hit by two missiles; and the targeting by the IRGC on 7 March of the oil tanker *Prima* in the Persian Gulf and of the oil tanker *Louis P* with a drone in the Strait of Hormuz. In the following days, USCENTCOM also reported the deployment by Iran of several suicide skiffs, small explosive-laden boats disguised as fishing vessels, as an additional interdiction tool. Regarding naval mines, by contrast, Iranian forces laid a limited but strategically critical number of devices in the Strait, using the minelaying ships destroyed by USCENTCOM between 10 and 16 March. In relation to this, at a later stage several American sources revealed Tehran's inability to track some of the mines already laid, a factor that prevented it from independently carrying out clearance operations. It is also significant that the IRGC claimed the launch of approximately 100 ballistic missiles and drones against the *Nimitz*-class aircraft

carrier *USS Abraham Lincoln* in the Gulf of Oman, although USCENTCOM categorically denied any damage to the unit, releasing photographs showing it in a state of full operational readiness on 7 March.



Figure 19 – IRGCN fast attack crafts approaching an oil tanker.

The impact of the closure of the Strait deserves separate treatment, since the disruption of commercial traffic constituted the most effective instrument of strategic pressure in Tehran's hands. In the first weeks of the conflict, indeed, commercial traffic through the Persian Gulf contracted by approximately 85%, with the price of crude oil reaching temporary peaks of 130 dollars per barrel in the first days of March. India and Pakistan, moreover, deployed naval units to escort their merchant ships in the Gulf of Oman, without however entering the Strait of Hormuz. In this context, on 19 March five European Countries and Japan issued a joint declaration on the need to guarantee the security of the route, while nevertheless subordinating any military involvement to the prior establishment of a ceasefire and to the construction of a multilateral naval coalition. The US Navy introduced a systematic presence in the Strait only on 11 April 2026, when the destroyers *USS*

Michael Murphy and *USS Frank E. Petersen* transited the channel with their Automatic Identification System (AIS) deliberately activated, a gesture that was both symbolic and operational, aimed at signaling the ongoing reopening. Mine clearance in the Strait of Hormuz was conducted through a distributed approach that integrated the mine-countermeasure packages of the *Independence*-class LCSs (*USS Canberra*, *Santa Barbara* and *Tulsa*) comprising UUVs, USVs and *MH-60S Seahawk* helicopters, in coordination with additional naval assets, autonomous systems and specialized units of the US Navy and allied forces. On 12 April, however, following the failure of the negotiations mediated by Oman, the United States established a total naval blockade of all Iranian ports, ordering US Navy units to prevent any traffic entering or leaving, as well as to intercept ships that had paid a toll to Tehran. In conclusion, the case under examination demonstrated paradigmatically that Iranian sea denial is not measured solely by the number of Western units damaged, but by the ability to produce systemic disorder, an increase in insurance and maritime costs, and a forced reallocation of global energy stocks.

2.3. The Lessons Learned from the Conflict

The lessons learned that emerge from the analysis of the maritime dimension of *Operation Epic Fury* concern at least four distinct levels. The first relates to the persistent value of asymmetric warfare in compartmentalized waters close to littoral areas. Despite overwhelming American naval and technological superiority, the Islamic Republic of Iran demonstrated its ability to impose a significant operational and commercial cost through low-cost means such as mines, USVs, FACs and anti-ship missiles deployable from mobile platforms distributed along the coast, forcing Washington to maintain a defensive architecture characterized by significant consumption of interceptors and

resources. From this perspective, the US National Security Council itself publicly admitted that it had underestimated Iran's capacity and willingness to close and keep closed the Strait of Hormuz, with cascading effects on the entire global energy system. The second level concerns the growing effectiveness of inter-domain fire against naval targets. The integrated use of *BGM-109 Tomahawks*, *Mk 48* torpedoes, PrSMs and ATACMS, as well as *GBU-72* penetrating bombs, *A-10 Thunderbolt IIs* in an anti-swarm role and *AH-64 Apaches* against OWA UAV assets, demonstrated that modern countering of the naval threat is no longer the exclusive monopoly of surface or underwater units, and that the kill chain is now distributed, multi-domain and capable of striking targets in port and on the open sea with a flexibility that challenges the taxonomies of traditional naval engagements. The use of the PrSM against naval targets marked a relevant precedent, since for the first time a new-generation land artillery system was employed in a maritime-strike role in a real combat situation. The third level, instead, concerns the sustainability of advanced defensive systems in a prolonged war of attrition. The figure of 5.6 billion dollars in munitions consumed in the first 48 hours, indeed, triggered alarms regarding the accelerated depletion of sophisticated weapons stocks, a structural problem aggravated by the fact that *MIM-104 Patriot* and *SM-6* assets were simultaneously employed both in the Iranian theatre and for the protection of regional allies. The fourth level, finally, concerns the role of coalitions in maritime warfare. The lack of prior consultation with NATO allies, indeed, made it effectively impossible to build a naval coalition for the reopening of the Strait, despite pressure from Washington. In this framework, the inability to articulate a credible exit strategy for the maritime dimension and to establish who would guarantee the security of the Strait after the offensive phase, with what means and under what mandate, exposed US strategy to its deepest vulnerability. At the doctrinal level, Operation *Epic*

Fury suggested a new conception of maritime warfare as an integrated system of logistics, persistent surveillance, distributed fire profiles, protection of critical infrastructure and management of commercial traffic under threat.



Figure 20 – Small Iranian naval unit engaged in a mine-laying activity in the Strait of Hormuz.

3. MILITARY OPTIONS IN THE LAND DOMAIN

Although Operation *Epic Fury* was conceived first and foremost as a multi-domain campaign centered on air-naval maneuvers, the possibility of a land military option was never ruled out. The notion of land warfare, in this context, must nevertheless be traced back to a range of limited but high-intensity activities, such as deep raids by special operations units, search and rescue missions in heavily contested environments (CSAR – Combat Search and Rescue), amphibious forcible entries or air assaults on littoral and insular nodes, temporary occupations of sensitive objectives, the creation of Forward Arming and Refueling Points (FARP) and the employment of expeditionary forces aimed at supporting the air-naval campaign and transforming its tactical effects into operational results. From this point of view, the episode of the recovery of the Weapon Systems Officer (WSO) of the *F-15E Strike Eagle* shot down on 3 April 2026 in the Islamic Republic of Iran constitutes a significant element insofar, as it reveals not only the coalition's ability to penetrate Iranian territory with special operations forces, helicopters, attack aircraft, aerial refueling tankers and support aircraft, but, above all, how any land or air-land action conducted deep inside Iranian territory requires a mass of protection, coordination and logistics on an almost operational scale. The preliminary conclusion is therefore that, in the Iranian theater, the land problem is not merely one of accessing the territory, but rather one of sustainability, exfiltration and protection of deployed forces or, potentially, of high-value assets, such as the 441 kilograms of Highly Enriched Uranium (HEU) in the possession of the Islamic Republic. In this context, the progressive build-up that preceded the operations served to shape the enabling framework for a maneuver of persistent pressure on the Iranian military apparatus, strongly centered on the use of air power. Although this deployment did not in itself

demonstrate the existence of a plan to invade the Islamic Republic, it nevertheless clearly highlighted the prerequisites for the preparation of an operational ecosystem capable of supporting selective land options. In this sense, four indicators proved to be of particular interest and deserve to be properly emphasized. First, the arrival of assets typically associated with direct support to ground forces or special units, such as the *AC-130J Ghost rider*, the *MC-130J Commando II*, the *HH-60/HH-60W Jolly Green II*, as well as approximately 1,000 elements of the *82nd Airborne Division*. Secondly, the redeployment of the 31st and 11th MEUs embarked on the *America*-class amphibious assault ship *USS Tripoli* and the *Wasp*-class amphibious assault ship *USS Boxer*, with their respective Amphibious Ready Groups (ARGs) and the growing attention directed toward Kharg Island as a potential land objective.¹ To this must be added, as a third element, the conduct of inter-domain fire activities by the United States through the use of ATACMS and PrSM assets against Iranian naval and coastal targets, which could potentially have facilitated an amphibious or air-mobile infiltration operation. Finally, the progressive construction of an environment of air superiority, through SEAD/DEAD and EW operations, as well as the neutralization of growing portions of Iranian missile and unmanned capabilities, served as an enabling factor for the conduct of operations in the land domain.

¹ On the one hand, the *USS Tripoli* has reportedly arrived in the Area of Operations; on the other hand, the *USS* is currently near Guam and Saipan, and it is uncertain whether it is still *en route* to the Middle East.



Figure 21 – Elements of a Marine Expeditionary Unit boarding a V-22 Osprey tiltrotor.

Within this framework, the downing of the *F-15E Strike Eagle* on 3 April 2026 and the subsequent recovery of its crew offered the best empirical evidence of what a circumscribed land military option inside Iranian territory could mean. The CSAR mission began in the early hours of 3 April, when a US *F-15E Strike Eagle* aircraft, identified as *DUDE 44*, was shot down over Southwestern Iran. Both crew members managed to eject successfully, but landed in different areas, immediately transforming the tactical situation into a dual recovery operation in hostile territory. From this perspective, while the pilot, designated *DUDE 44 Alpha*, ended up in a relatively accessible area, the WSO, renamed *DUDE 44 Bravo*, crashed in a mountainous area attributable to the Zagros region, which was more difficult to reach rapidly with a rescue force. According to reconstructions, the first recovery mission was a traditional high-risk CSAR operation, launched almost immediately after the shutdown on 3 April. The initial force included 10 *A-10 Thunderbolt IIs*, *HC-130J Combat King* aircraft, *HH-60W Jolly Green II* helicopters and Air Force Special Tactics (AFST) personnel. This first wave

penetrated Iranian airspace in broad daylight, under the cover of a broader protection package, and managed to recover the pilot within a few hours. The phase, however, was anything but bloodless: one of the *HH-60W*s appears to have been hit by small arms fire, resulting in wounded personnel on board, while one of the *A-10 Thunderbolt II*s employed in close escort operations was damaged so severely that the pilot was forced to continue into Kuwaiti airspace and then eject there.

The recovery of the WSO, on the other hand, marked a leap in scale due to the greater complexity of the situation, deriving both from the characteristics of the terrain and from the officer's health condition. Even before the arrival of rescuers, indeed, to avoid capture the WSO moved several kilometers across rugged terrain, treated his wounds independently, found shelter in a mountain cavity and finally managed to reestablish contact with the American rescue chain. Meanwhile, a deception operation was launched to confuse the Iranian search effort, while the military apparatus reportedly intervened both by disrupting Iranian electronic systems and by carrying out kinetic operations to slow the approach of hostile forces into the area. The second phase, namely the one specifically intended for the recovery, was planned as a distinct and highly elaborate operation, carried out through a mixed air component based on two *MC-130J Commando II*s and exploiting a landing zone located on agricultural terrain. According to the details that emerged after the operation, the plan called for the landing of the two *MC-130J*s, the securing of the collection point, the unloading of the transported *MH-6 Little Bird* assets and their rapid reassembly. These light helicopters would then cover in a few minutes of flight the distance separating them from the ridge where the WSO was hiding, before bringing him back to the forward site. Once the WSO had been recovered and brought back to the landing area, however, the two *MC-130J*s encountered a critical problem that prevented them from taking off. The situation

required an immediate revision of the exfiltration plan, which was reorganized by smaller aircraft, suitable for short and light landings, brought into the area, with the evacuation conducted in successive waves. In retrospect, the second mission involved a total of 155 aircraft, including 4 bombers, 64 fighters, 48 aerial refueling tankers and 13 rescue assets, in addition to further unspecified systems. The coalition also carried out an elaborate deception operation, dispersing assets across seven different areas to confuse Iranian forces. In parallel, numerous roads and access routes to the areas concerned were targeted and cratered, to slow the influx of Iranian ground military units. Overall, the mission led to the recovery of the WSO, with the loss of 2 *MC-130J Commando IIs* (immobilized and self-destroyed by US forces) one *A-10 Thunderbolt II* (hit during the CSAR and crashed in Kuwait) and 4 *MH-6 Little Bird* helicopters (self-destroyed at the recovery site).



Figure 22 – Elements of airborne infantry near a CH-47 Chinook helicopter.

From a doctrinal standpoint, the episode demonstrated, first of all, that the coalition possessed the capability to create a FARP in enemy territory within a very short timeframe, using *MC-130 Commando IIs*, special operations units, air traffic controllers in an

austere environment, perimeter security elements, as well as assets for refueling, ammunition support and distributed command, all integrated within a broad bubble of air, electronic, ISR and logistical protection. Secondly, the Iranian terrain (mountainous, segmented, difficult to surveil and favorable to the convergence of local and state forces) made land action possible, although intrinsically fragile in its posture. It follows that, once tactical access has been secured, the ability to sustain operational presence becomes the decisive variable.

Considering the analysis conducted, three realistic scenarios can therefore be outlined regarding what a US intervention in the land domain could have been, but which did not materialize. The first conceivable scenario is that of an insular-littoral intervention option, centered on the occupation of Kharg Island, which handles approximately 90% of Iranian oil exports. The US Administration, indeed, could have considered the seizure of the island as a possible subsequent phase of the campaign, a thesis supported by the arrival in the Area of Operations of the amphibious assault ship *USS Tripoli* with the 31st MEU, for a total of approximately 2.200 embarked Marines, and by the movements of the amphibious assault ship *USS Boxer* with the 11th MEU. Such a scenario would have translated into the construction of an expeditionary option for the temporary conquest or neutralization of a strategic coastal node, with potentially multiple purposes, ranging from reducing Iran's ability to threaten the Strait of Hormuz to increasing energy pressure on the Country, from depriving it of a logistical and symbolic hub to acquiring a potential instrument of negotiating leverage. An operation of such scope would nevertheless have required a series of preliminary conditions that would have been difficult to satisfy simultaneously, including local air supremacy, the availability of mine countermeasures, the suppression of Iranian coastal batteries and continuous protection against

missiles, aerial and naval drones, and fast attack crafts. This scenario, although plausible on paper, did not materialize.

The second hypothetical scenario, instead, is that of strategic raids against sensitive sites of the Iranian nuclear and missile apparatus, conducted by US forces and the IDF. The option of a raid carried out by special operations forces units to secure or neutralize Iranian HEU would have been risky, but not conceptually impossible. The critical issue, however, would not have been entry, but rather the exfiltration of the operators: locating the material, reaching it, taking physical control of it, operating with specialized technicians, extracting it or destroying it in place would have required time, cover, information dominance and a security cordon around the objective. The indications gathered around the Isfahan area, the WSO recovery mission and the use of austere airstrips suggested that US forces were at least developing the apparatus necessary for this type of operation. In this case as well, however, the scenario did not actually materialize.



Figure 23 – Members of US Air Force Special Tactics aboard an MC-130J Commando II during a CSAR activity.

The third potential scenario, finally, is that of targeted incursions and temporary footprints: personnel recovery actions, capture or elimination of high-level figures, sabotage of facilities, target designation, assistance to precision strikes, creation of FARP nodes or provisional support bases. Within such a framework would fall the presence of *AC-130Js*, elements of the 82nd Airborne Division, the movement of *MC-130 Commando IIs*, the deployment of land-based *F-35C Lightning IIs*, as well as the growing use of amphibious forces and systems for special operations. It would not have been, therefore, a matter of invading the Islamic Republic, but of building a constellation of limited land options capable of supporting, multiplying or finalizing the effects of the air-maritime campaign. This scenario too, although supported by concrete indicators of preparation, did not receive operational confirmation.

Overall, from an organizational point of view, Operation *Epic Fury* confirmed the maturation of an expeditionary and multi-domain model in which limited land maneuver would have been possible only if preceded by a theater build-up characterized by persistent ISR, massive refueling, electronic warfare, attrition of air defenses, missile protection of bases, strategic mobility and amphibious presence. In other words, the land domain would not have replaced the air and maritime domains but would have become their most delicate terminal function. In conclusion, a direct land intervention against the Islamic Republic of Iran would have been plausible only in a selective, episodic and surgical form, enhancing the concept of joint forcible entry operation. The most credible land option in the context of Operation *Epic Fury* was therefore to be understood not as the overcoming of the multi-domain campaign, but as its punctual and terminal extension.

4. THE CROSS-DOMAIN COUNTERMEASURE AGAINST THE AIR AND MISSILE THREAT

Operations Epic Fury and Roaring Lion led to the launch of an Iranian air and missile targeting campaign, in which the Islamic Republic and its proxies carried out numerous multi-vector attacks, involving OWA UAVs, cruise missiles and ballistic missiles, against critical targets such as military bases and hydrocarbon production infrastructure, as well as against merchant ships transiting the Persian Gulf and the Strait of Hormuz. A conflict of such intensity has enabled an in-depth analysis of the ways in which the countries involved organized their air defenses, with the aim of ensuring the protection of national territory and the strategic infrastructure essential to the war effort. In this context, the study focuses on the integrated systems employed to ensure an effective defensive capability, assessing both their performance and their critical weaknesses, so as to outline a comprehensive picture of the architecture that should characterize air defense in a contemporary warfare scenario. To this end, the analysis examined three main models, distinct from one another but united by the need to respond to complex and multidimensional threats. Firstly, the architecture adopted by the United States in coordination with the Gulf States, which was based on the integration of air, naval and land-based systems and pursued the dual objective of ensuring the security of allied territories and the protection of US military installations in the area. Secondly, the case of Israel, whose defense system has progressively taken the form of a multi-layered structure capable of intercepting threats differentiated by range and nature. Finally, Iranian air defenses, the analysis of which has highlighted the strategic choices made by Tehran, which has been called upon to devise operational solutions in a context marked by constraints of a contingent and structural nature.

4.1. The Structure of Air Defense in the Gulf

Before analyzing the air defense architecture established to protect the Gulf States, it is necessary to provide some clarification regarding the deployment of capabilities aimed at strengthening the region's defenses. Indeed, to establish such a defensive architecture, it was necessary to deploy a significant number of air, naval, and land-based systems to the Middle East theatre. Whilst the deployment of air and naval assets has been covered in the previous chapters, it is worth focusing on the land-based capabilities that the United States have deployed in addition to those already present. In the weeks leading up to the outbreak of hostilities, the Pentagon deployed additional air defense and anti-missile systems, including 2-3 battalions of *MIM-104 Patriots* and 1-



Figure 24 – Patriot battery being unloaded from a C-17 Globemaster III cargo aircraft.

2 THAAD batteries, which were distributed across US bases in Iraq, Saudi Arabia, the United Arab Emirates, Qatar, Kuwait and Bahrain. The transfer of these capabilities was carried out using *C-17 Globemaster III* strategic transport aircraft: as a matter of fact, over the course of some 70 flights, the air defense batteries were redeployed to bases in the Middle East, further strengthening the forces already in place prior to the escalation.

Analyzing the air defense architecture deployed by the United States and the Gulf States, it can be seen that it was based on the IAMD concept, which involves the integration of space-based sensors, ground based and naval radars, C2 systems and interceptor platforms within a single operational network, with the aim of tracking, classifying and neutralizing air and missile threats across the entire threat spectrum. During the hostilities affecting the Middle East, particularly in the Persian Gulf states, this doctrinal concept found full application, even though implementing such a defensive operation requires the adoption of precise procedures and extremely tight timeframes.

The first phase of IAMD relies on *Space-Based Infrared Systems* (SBIRS), which provide an early warning function, that is, the detection of missile launches immediately after the ignition of the engines. Once the missiles have been detected, the SBIRS systems transmit the alert to US C2 centers, enabling the timely activation of air defenses. Subsequently, long-range radars come into action, including the *AN/TPY-2* ground-based radar, associated with the THAAD system and designed to track long-range missiles. These are then supplemented by the *SPY-1* and *SPY-6* naval radars, installed on US destroyers equipped with the *Aegis* system, such as the *Arleigh Burke*-class vessels deployed in the Persian Gulf area, which provide a particularly advanced surveillance capability as they are capable of simultaneously tracking hundreds of targets. Once the threat has been detected by the long-range sensors, the tracking process is then transferred to the network of regional radars, including the *AN/MPQ-65* radars of the *MIM-104 Patriot* systems deployed at major US military bases in the Gulf States in the weeks leading up to the conflict. These radars then play a central role in target detection, continuous tracking, and interceptor guidance, thereby ensuring the operational coherence of the entire defense system. Furthermore, thanks to the use of phased array technology, they are capable of simultaneously

monitoring a large number of threats, significantly increasing the overall effectiveness of surveillance and engagement capabilities.

All the information gathered during the various phases is then integrated into a Command and Control, Battle Management and Communications (C2BMC) network, which enables the creation of a highly detailed common operational picture. Once the data has been integrated, the process moves to the battle management level, coordinated through the *Integrated Battle Command System* (IBCS) and USCENTCOM's C2 nodes. The IBCS enables the connection of sensors and launchers belonging to different systems, such as THAAD and *MIM-104 Patriot*, creating a shared radar dataset that can be used by any platform with an air interdiction capability. This capability, known as sensor shooter decoupling, is a central element of integrated defense, as it allows a target to be engaged using data provided by sensors not integral to the weapon system in use, thereby increasing the system's operational flexibility and resilience. However, this architecture also introduces a critical dependency on the continuity of communications and the resilience of the network. In scenarios characterized by advanced jamming, cyber-attacks or the neutralization of C2 nodes, the degradation of the information flow can in fact significantly reduce the overall effectiveness of the systems. In this sense, the entire system can be interpreted as an integrated kill chain, in which the detection, tracking, decision and engagement phases are distributed but constantly connected within the operational network.

From a doctrinal perspective, the IAMD architecture reflects a concept of air defense based on information superiority and the central role of the communication network linking sensors and effectors, the aim of which is not merely to intercept the threat, but to anticipate, track and manage it throughout the entire operational cycle through continuous data fusion. However, this approach, which is highly effective against traditional threats,

shows increasing limitations when faced with distributed, low-cost and high-volume threats such as swarms of drones, which tend to saturate the system and exploit its economic and logistical rigidities. Still within the battle management phase, the system used for interdiction proceeds to assess the threat: parameters such as trajectory, predicted point of impact and time remaining until impact are calculated, and based on these elements, it is determined whether the carrier poses a threat to sensitive targets. If so, engagement planning proceeds by selecting the most appropriate interceptor based on the type of threat and the phase of its trajectory.



Figure 25 – MIM-104 Patriot batteries in action.

During the conflict, the main systems deployed were THAAD, MIM-104 Patriot PAC-3 MSE, and Aegis. THAAD, first and foremost, is designed to intercept short-range (SRBM) and medium-range ballistic missiles (MRBM) in the terminal phase of flight, even at very high altitudes and both within and outside the atmosphere, using hit-to-kill interceptors. The MIM-104 Patriot systems, on the other hand, operate solely in the endo-atmospheric defense against ballistic missiles, cruise missiles and drones, as well as against

aerial threats, also employing hit-to-kill interceptors. Finally, *Aegis* platforms use missiles from the *Standard Missile* family, such as the *SM-2* for the interception of cruise missiles and aircraft, the *SM-6* for countering air and ballistic threats in the terminal phase, and the *SM-3* for the interception of ballistic missiles even in the exo-atmospheric phase of flight. Following the launch of the interceptor, the kill assessment phase begins, during which sensors verify that the threat has been neutralized and, if necessary, initiate a further engagement.

An additional element of the US IAMD architecture is represented by systems for Countering Rockets, Artillery and Mortar rounds (C-RAM), which have also been widely deployed for close-in protection against Iranian drones. These systems incorporate radar, ballistic calculation capabilities and high-rate-of-fire cannons, factors that enable the neutralization of threats in the final seconds before impact. In the context of the conflict, such assets have been deployed primarily to protect military bases, critical infrastructure, and diplomatic buildings, with reference to systems belonging to the *Phalanx Centurion* family. At the same time, similar capabilities are also integrated onto US naval platforms in the form of *Close-In Weapon Systems* (CIWS) such as the *Vulcan Phalanx*, which represents an essential component of the Very Short-Range Air Defense (VSHORAD) of destroyers and aircraft carriers deployed in the AoO.

4.1.1. CAP Operations in the Gulf

The above outlines how air defense operates in both land-based and naval contexts; however, this capability has been supplemented by a further operational dimension based on the deployment of Combat Air Patrol (CAP) missions. In this context, such operations have taken on a particularly significant role in countering aerial threats, proving decisive above all in the

interception of Iranian drones of the *Shahed* family. CAP missions are, in fact, an essential element of integrated air defense, as they perform a complementary function within the overall architecture of airspace protection. Their necessity stems directly from the specific characteristics of the threat posed by OWA UAVs, which require a more flexible and dynamic approach than that provided by land-based and naval systems alone. In particular, *Shahed* drones have proved particularly difficult to intercept due to their reduced detectability, as they operate at low altitude and have a limited radar cross-section and a low infrared signature, as well as frequently being deployed in coordinated swarms, factors that significantly increase their ability to penetrate defenses. As emerged during the conflict, these systems were deployed with the aim of saturating air defenses. In this context, the CAPs were tasked with neutralizing part of the threat before it penetrated the airspace of the Gulf States, thereby helping to reduce the complexity of defensive management. From an operational perspective, CAP patrols were organized according to predefined flight patterns in areas deemed particularly critical, so as to ensure continuous coverage and a timely response to possible incursions. Aircraft from both US forces and Gulf States were deployed in these operations. In particular, the United States deployed *F-16 Fighting Falcon* and *F/A-18 Super Hornet* multi-role fighters. These were joined by aircraft from the Gulf states, including those of the United Arab Emirates, which deployed *F-16Es* and *Mirage 2000s*.

The fighter aircraft deployed in CAP operations operate on a continuous patrol basis, made possible by the use of *KC-135 Stratotanker* aircraft for aerial refueling, which ensures operational endurance. The effectiveness of such operations, however, depends largely on the degree of integration of the platforms within the C2 system. In this regard, a central role is played by AWACS such as the *E-3 Sentry*, which provides data that can be fully integrated with that from ground-based and naval radars,

thereby enabling fighter aircraft to have a constantly updated picture of the airspace. The integration between AWACS, ground-based and naval sensors, and ISR systems is, overall, fundamental for detecting *Shahed*-family OWA UAVs, which, due to their technical characteristics, can evade systems operating in isolation. Conversely, cooperation between different types of sensors significantly reduces the risk of failure to detect and increases the overall resilience of the defensive system. In this operational context, once a drone has been detected in the airspace, interception via CAP involves the AWACS or the relevant C2 center assigning the target to the nearest fighter, considering fuel availability and the type of weaponry carried. The pilot is then provided with precise information regarding the target, such as direction, distance, altitude, and speed, enabling rapid positioning for the subsequent engagement phase.



Figure 26 – An F-16 Fighting Falcon fighter jet neutralizing an OWA UAV of the Shahed family.

This is followed by the acquisition phase, which is particularly critical because the on-board radars of fighter aircraft are not very effective against low-observable targets such as drones. For this reason, pilots often rely on infrared sensors, such as theIRST (Infrared Search and Track) system or the FLIR (Forward Looking Infrared) pod, exploiting the thermal signature of the drone's

engine, which, although reduced, is sufficient under favorable conditions, particularly during night operations. Once the target has been acquired, identification and then engagement follow, generally using infrared-guided missiles such as the *AIM-9 Sidewinder*, which do not require continuous radar lock-on and are particularly effective against low-altitude targets. During the conflict, however, radar-guided missiles, such as the *AIM-120 Advanced Medium-Range Air-to-Air Missile (AMRAAM)*, were also deployed, but their effectiveness proved inferior against targets with a very small radar cross-section. A further critical element in CAP operations was the management of the swarms of drones deployed by the Islamic Republic in saturation attacks. In such scenarios, C2 assigns targets to various fighter aircraft, establishing priorities based on trajectory and potential threat. However, each aircraft has a limited number of interceptors, which restricts the overall capability of the countermeasure system. Consequently, whilst CAP missions are fundamental, they were not sufficient on their own to guarantee a complete defense of the Gulf States' airspace. Overall, CAP operations have therefore emerged as a flexible, pre-emptive defense tool, particularly effective against low-observable threats, but have been structurally constrained by the availability of platforms, the number of interceptors they can carry, and the need for constant integration with a highly complex C2 system. This highlights how CAP operations represent an effective but economically burdensome tool in the long term, especially when deployed against low-cost and high-volume threats.

4.1.2. Effectiveness and Shortcomings of US and Allied Air Defense Architectures

Following an analysis of the IAMD architecture adopted by the United States and the Gulf States, the next step involves assessing its operational effectiveness. In quantitative terms, the defense

system under review has shown generally satisfactory results, with interception rates ranging roughly between 70 and 85 percent. More specifically, performance was particularly high against missile delivery systems, with approximately 90 percent of ballistic missiles intercepted and figures approaching 100 percent for cruise missiles, whilst lower results were recorded for OWA UAV systems, estimated at between 60 and 70 percent. From a qualitative perspective, however, the integrated multi-layered architecture, based on interoperability between US assets and local systems, enabled the creation of a coherent and layered defensive structure capable of significantly mitigating the impact of attacks, preventing significant weaknesses in the overall defense system. However, an analysis of the operations highlights three main critical issues.

The first concerns Iran's strategy of saturation using swarms of low-cost drones combined with missile systems, with the aim of achieving even a single decisive penetration. In such a scenario, it is sufficient for a limited number of delivery systems to breach defenses to cause significant damage to high-value infrastructure. The second critical issue is the cost asymmetry between offensive delivery systems and defensive interceptors, which has contributed to creating a significant economic disadvantage for the defender. *Shahed-136* drones, costing around \$20,000 per unit, have often been intercepted using *MIM104 Patriot PAC-3 MSE* missiles, whose unit cost is around \$4 million. Finally, the third critical issue concerns the logistical and industrial dimension. The high tempo of operations has, in fact, put pressure on stocks of interceptors for the *MIM-104 Patriot*, *THAAD* and *Aegis* systems, leading to a contest between Iranian offensive capabilities and the defensive reserves of the United States and its allies. This has highlighted the limitations of the US industrial base, which is not structured to sustain a prolonged war of attrition but is instead geared towards just-in-time production models. Overall, an

analysis of critical issues and quantitative data reveals that the main weakness of the integrated US and allied defense was a lack of a fully adequate preparation to counter swarms of *Shahed-136* drones. It was highlighted that the allies did not initially have economic interception systems similar to the Ukrainian *Sting* drones, which are characterized by low costs and ease of large-scale production. The adoption of such solutions, however, was considered during the conflict itself, to the extent that Saudi Arabia initiated cooperation with Ukraine for the acquisition of interceptor drones and the training of personnel dedicated to countering unmanned systems.



Figure 27 – Arleigh Burke-class destroyers deploying their Aegis systems.

4.2. Israel's Multi-Layered Defense

The State of Israel, for its part, has developed an air defense system based on a doctrine centered on two fundamental concepts: layered defense and selective interception. In practice, each level of the layered defense is designed to intervene at a specific stage of the trajectory of the attack vehicle. The aim of such an

architecture is to intercept the threat as far away as possible, whilst maintaining subsequent layers capable of intervening in the event of failure. Furthermore, the Israeli defense system is structured not to automatically engage the target, but to assess whether it poses a real threat to a sensitive objective by calculating its potential point of impact, to optimize the deployment of interceptors. This approach has enabled Israel not only to increase the operational effectiveness of its IAMD architecture, but also to optimize the use of the resources at its disposal by reducing the consumption of interceptors against irrelevant threats and contributing to the sustainability of the system in prolonged engagement scenarios.

In practice, this is achieved through an integrated operational architecture comprising sensors, C2 systems and interceptors, both kinetic and non-kinetic. The sensors, first and foremost, include ground-based radars such as the *EL/M-2084*, used for medium-range tracking, and long-range systems such as *Green Pine* and *Super Green Pine*, which serve instead as early warning systems for countering ballistic missiles. To these are also added the US SBIRS satellite systems, designed for infrared detection of ballistic missile launches during the initial stages of flight. The information generated by these sensors, particularly those relating to the timely detection of Iranian missile launches, has likely been integrated into the broader mechanisms of intelligence cooperation between the United States and Israel regarding air and missile defense. Such cooperation does not necessarily imply direct access to raw satellite data, but rather the transmission of early warning products and processed information, fed into joint or interoperable C2 centers. In this context, the US contribution serves as a supporting element for the sensor chain of the Israeli IAMD architecture, strengthening its capacity for timely reactions. At the heart of this architecture lies the *battle management control* system, a software system that integrates data from all sensors, constructing a real-time operational picture, and managing the

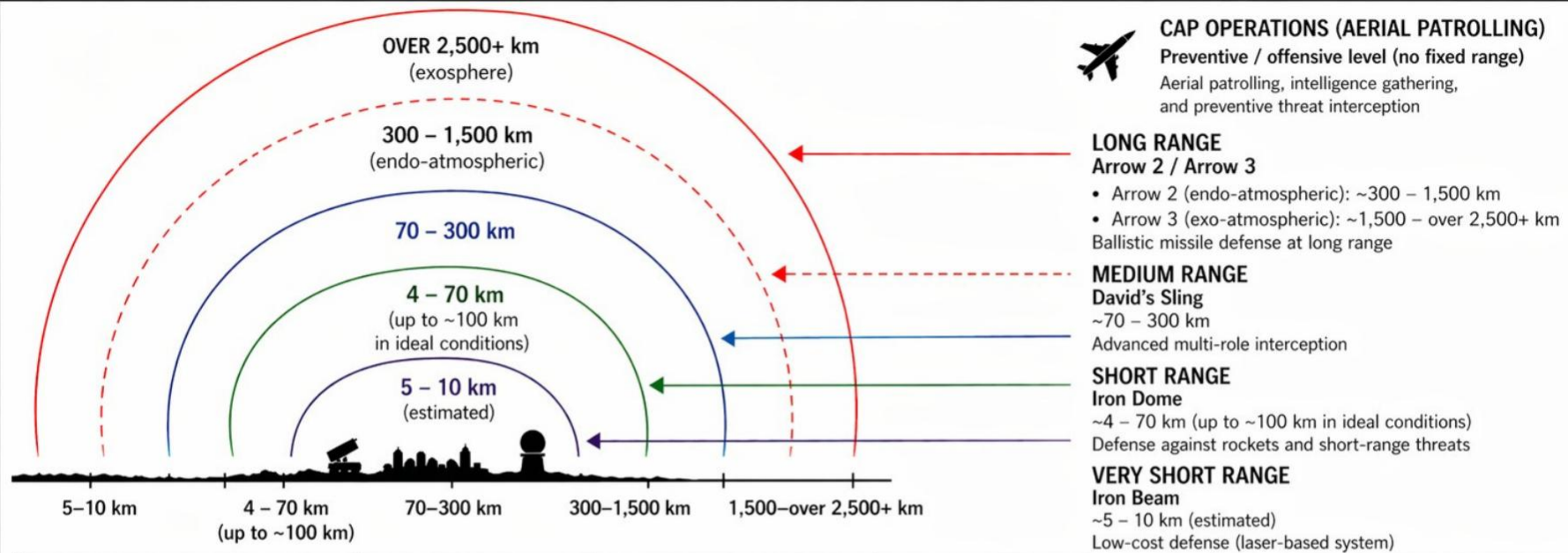
entire engagement process. The system is not limited to data transmission but, through algorithms that assess the nature of the threat, the point of impact and the available resources, autonomously decides whether or not to proceed with the interception: it is at this stage, therefore, that the application of the doctrine of selective interception takes shape.

To understand how Israel's air defense system has operated in the context of the conflict with the Islamic Republic, it is necessary to analyze the entire interception cycle in its logical and functional sequence. Firstly, the early warning phase was ensured by the integration of SBIRS satellite systems with the *Green Pine* and *Super Green Pine* ground-based radars, which enabled the initial detection of launches and an initial estimation of the trajectories of the Iranian attack vehicles. Subsequently, this early warning capability was reinforced by the activation of ground-based radars, which ensured continuous, high-resolution tracking, updating data on the position, speed, and flight profile of the threats in real time. The information thus gathered was fed into the C2 system, which performed data fusion and target classification, integrating inputs from heterogeneous sensors, and constructed a coherent operational picture of the tactical situation. On this basis, the decision-making phase was then developed, during which the competent authorities assessed the need to proceed with engagement, depending on the type of threat and the associated risk. Should interception had been authorized, the system selected the most suitable interceptor, based on the characteristics of the incoming vehicle, and the most appropriate level of defense. Finally, the actual interdiction phase was reached, entrusted to the multi-level structure of the layered defense, in which various weapon systems operated in a coordinated manner to neutralize incoming threats based on their altitude, speed and distance, thereby ensuring the maximum effectiveness of the overall defense system.

In this context, the closest-range defense is provided by the *Iron Dome* system, whose batteries consist of *EL/M-2084* radars and mobile launchers equipped with *Tamir* interceptor missiles. The latter operate by detonating near the target (proximity fuze), making them particularly effective against rockets, artillery and short-range drones, which are characterized by relatively short trajectories and engagement times. At an intermediate level is *David's Sling* system, designed to broaden the engagement spectrum and counter more complex threats, such as SRBMs, cruise missiles, and large caliber rockets. Operating at ranges between 40 and 300 kilometers and at altitudes below 15 kilometers, this system provides a link between short- and long-range defense. The interceptors used, the *Stunner* missiles, based on a hit-to-kill principle, are guided by continuous updates from the C2 system and, in the terminal phase, employ a combined radar and electro-optical guidance system, which significantly increases their accuracy. Finally, at the highest level is the *Arrow* system, fully integrated with the *Green Pine* radars and the *Citron Tree* command system, and designed to intercept SRBMs and MRBMs. In this case, the system operates at ranges of up to approximately 2.400 kilometers and at altitudes of around 100 kilometers, in the exo-atmospheric phase of the trajectory. The *Arrow-2* and *Arrow-3* interceptors neutralize threats through direct impact (hit-to-kill), thereby ensuring strategic defense capability against long-range, high-speed delivery systems.

ISRAELI MULTI-LAYER AIR DEFENSE SYSTEM

Integrated defense against aerial threats, missiles and drones across multiple engagement levels



DEFENSE LAYER	SYSTEM	INTERCEPTORS	PRIMARY ROLE	ENGAGEMENT RANGE
CAP OPERATIONS (AERIAL PATROLLING)	CAP (Combat Air Patrol)	F-15, F-16, F-35 (and other aircraft)	Preventive interception, air superiority, intelligence gathering	Variable (no fixed range)
LONG RANGE (ballistic missiles)	ARROW (Arrow 2 / Arrow 3)	Arrow 2, Arrow 3	Ballistic missile defense (endo + exo atmospheric)	Arrow 2 (endo-atmospheric): ~300 – 1,500 km Arrow 3 (exo-atmospheric): ~1,500 – over 2,500+ km (not limited theoretically)
MEDIUM RANGE (missiles, aircraft, UAV)	DAVID'S SLING	Stunner	Advanced multi-role interception	~70 – 300 km
SHORT RANGE (rockets, mortars, UAV)	IRON DOME	Tamir	Defense against rockets and short-range threats	~4 – 70 km (up to ~100 km in ideal conditions)
VERY SHORT RANGE (close-range threats)	IRON BEAM	Laser	Low-cost defense (laser-based)	~5 – 10 km (estimated)

Figura 28 – Overview of Israel's multi-layered air and missile defense architecture.

The phases following the launch of the interceptor show considerable consistency across the three levels of the layered defense. Firstly, guidance during the mid-course phase is provided by continuous updates from the C2 system. Subsequently, in the terminal phase, the interceptor autonomously acquires the target, finally neutralizing it through a proximity detonation or a direct hit (hit-to-kill). To complete the cycle, the system performs a kill assessment to verify the effective destruction of the threat and, if necessary, initiates a new engagement, potentially delegating it to a lower level of the defense system as part of a strategy of redundancy and maximization of effectiveness. However, within the overall framework of Israeli air defense, the layered ground-based component does not exhaust the entire spectrum of interception capabilities but is integrated with an active airborne component that plays an equally significant role. This component operates through CAP missions, which contribute significantly both to the defense of the airspace and to the maintenance of air superiority. Unlike what was observed in other regional contexts, such as that of the Gulf States, where CAPs tended to assume a predominantly defensive role and served to relieve the burden on missile systems, in the Israeli case they were configured as a broader and more integrated instrument, situated at the boundary between air defense and offensive projection. From this perspective, Israeli CAP missions were not limited to merely intercepting incoming threats but also to perform airspace control and adversary capability denial functions, actively contributing to the degradation of the enemy's offensive potential. From an operational standpoint, these missions were conducted by advanced multi-role fighters, including *F-15I Ra'am*, *F-16I Sufa* and *F-35I Adir*, which are fully integrated into the national C2 network. These platforms operated in close synergy with ground-based and satellite early warning systems, as well as with aerial surveillance assets, contributing to the creation of a shared and constantly

updated operational picture. This resulted in a significant reduction in reaction times and in greater speed in assigning targets to patrolling aircraft, with a consequent increase in the overall probability of interception.

In this context, a distinctive feature of Israel's use of CAPs is their role in early interception, which positions them as a genuine outer layer of the layered defense system. Indeed, they engage in threats such as drones and cruise missiles before they can penetrate the operational range of ground-based systems, thereby helping to increase the overall depth of the defense. This approach also allows for the preservation of the most advanced and expensive interceptors deployed in medium- and long-range systems, such as those of *David's Sling* and *Arrow*, thereby improving the operational sustainability of the entire system. From a tactical perspective, engagement varies depending on the type of threat: low observable targets, such as drones, are frequently intercepted usingIRST sensors and IR-guided missiles, whilst radar-guided missiles may be employed against more complex platforms. However, as observed in other operational theatres, CAPs in the Israeli context also presented structural limitations linked both to the number of available platforms and to the quantity of weapons that could be carried; they were therefore particularly effective as a first line of defense, but insufficient, if deployed in isolation, to counter large-scale saturation attacks. Overall, within the Israeli system, CAP operations constituted a highly flexible and deeply integrated tool, capable of extending the depth of air defense and simultaneously contributing to the protection of the territory and the maintenance of air superiority. Their integration with the multi-tiered ground component therefore represents an advanced example of synergy between static and dynamic elements of defense, highlighting an evolved concept that is not limited to the mere interception of threats, but is extended to the active and proactive control of airspace.



Figure 29 – F-15I Ra'am aircraft engaged in a Combat Air Patrol.

Given the integration between ground and air components, the Israeli system demonstrated particularly high levels of effectiveness, including in terms of performance. Aggregated data indicated an interceptor-launch ratio generally ranging between 80 and 90 percent, although this figure varied depending on the type of threat in question. More specifically, ballistic missile neutralizations stood at rates of between 90 and 95 percent, whilst in the case of drones, slightly lower figures were recorded, indicatively between 80 and 85 percent, though these remained higher than those observed in other regional contexts, such as the Gulf States. Despite these results, the system also had some structural weaknesses, largely similar to those already highlighted in other operational theatres. There remained a marked cost asymmetry between offensive delivery systems and defensive interceptors, as in the case of *Tamir* missiles, which affected long-term economic sustainability, especially in scenarios characterized by saturation attacks. However, the overall robustness of the Israeli system lied in its multi-layered architecture, which ensured a high degree of operational redundancy, as well as in the high level of integration between

sensors, C2 systems and missile batteries. This integration allowed, on the one hand, extremely rapid reaction times and, on the other, a remarkable capacity for threat discrimination and selection. To these factors is added a well-established operational experience, gained over the course of previous conflicts, which contributed significantly to the overall effectiveness of the system. As part of this evolutionary approach, Israel has also developed a further layer of defense represented by the *Iron Beam* system, based on Directed Energy Weapon Systems (DEWS). This innovation is designed to address the issue of the economic sustainability of air defense, offering a more efficient response capability against saturation attacks and gradually reducing reliance on traditional kinetic interceptors.

4.3. The Islamic Republic's Air Defense

The Islamic Republic of Iran has built its air defense through a hybrid approach, based on a combination of foreign acquisitions, predominantly Russian and Chinese, reverse engineering and the development of national systems. This has resulted in a structure which, whilst exhibiting a certain degree of complexity and stratification, is characterized by a high level of technological and organizational heterogeneity, without, however, achieving the extent of integration and coherence typical of Western air defense systems. Nevertheless, this architecture is based on the coordinated use of radar sensors and surface-to-air missile systems, integrated within a centralized C2 chain headed by the Khatam al-Anbiya air defense base, which is responsible for operational coordination at the national level. In theory, this structure should allow for unified management of information and operations. However, in practice, the marked heterogeneity of the technologies employed negatively affects the effective interoperability between the various systems. Consequently, both

the capacity for data fusion and the construction of a reliable and shared Common Operational Picture are limited, partly due to the absence of standardized and sufficiently resilient data links. This critical issue results in reduced efficiency in the transmission and processing of information, with potential repercussions on the timeliness of decision-making and, more generally, on the overall effectiveness of the air defense system.

Regarding its sensor capabilities, the Islamic Republic possesses a relatively wide range of radar systems, including long-range platforms such as the *Ghadir* and the *Matla-ol-Fajr*, which are primarily used for early warning and the initial detection of airborne and missile threats. These are complemented by three-dimensional radars such as the *Najm-802* and the *Kashef-99*, capable of providing more detailed information on the altitude, range and direction of targets, thereby contributing to tracking and supporting the subsequent phases of the engagement cycle. In parallel with active radars, the Country has also developed passive surveillance capabilities and over-the-horizon systems, with the aim of reducing vulnerability to air defense suppression operations and improving the detection of low-observable targets. However, although these developments indicate an attempt to diversify and strengthen the sensor component, the operational effectiveness of these systems remains uncertain and difficult to verify based on the available information. Overall, therefore, Iran's sensor network appears to be extensive and complex, but not fully integrated: the limited ability to fuse data from diverse sources and the lack of a highly interoperable C2 infrastructure affect the quality of the operational picture, reducing the overall effectiveness of the air defense system.



Figure 30 – Illustration of an F-15E Strike Eagle air superiority fighter performing an evasive maneuver following the launch of a missile from a MANPADS.

With respect to long-range defense, the Islamic Republic deploys systems such as the Russian-made *S300PMU-2* and the domestically produced *Bavar-373*, which form the core of its capability to engage high-altitude and long-range threats. The former is based on the *Tomb Stone* radar and missiles from the *48N6* family, whilst the latter incorporates Active Electronically Scanned Array (AESA) radars such as the *Meraj-4* and *Sayyad-4* interceptors, elements that reflect an Iranian attempt to develop advanced indigenous solutions. However, in high-intensity operational scenarios, both systems have revealed significant limitations, particularly regarding their vulnerability and the difficulty of operating effectively under heavy electronic pressure. SEAD/DEAD operations conducted in the early stages of the conflict, in fact, highlighted several critical issues, such as limited shoot-and-scoot capability and insufficient protection of deployment sites and reduced resilience in the absence of continuous and reliable long-range radar coverage. At the intermediate level, Iran's air defense relies on systems such as the *Khordad-3* and the *Khordad-15*, which are based on phased-array radar and missiles

from the *Sayyad* family. In this case, however, operational effectiveness is heavily dependent on the quality and continuity of the targeting data received from the sensor network and the C2 chain. In a degraded environment, characterized by electronic jamming, loss of long-range sensors and disruption of C2 communications, such systems tend to operate predominantly in a reactive and local manner, resulting in a significant reduction in their strategic effectiveness. Furthermore, although some of these systems were designed to be mobile, operational use has highlighted a frequent adoption of static or semi-static deployment patterns, factors which have thus increased their vulnerability to detection and neutralization by opposing forces. As for Short-Range Air Defense (SHORAD), the Iranian apparatus can count on systems such as the *Tor-M1*, a Russian-made system equipped with a radar with a range of between 20 and 25 kilometers and armed with *9M331* missiles, as well as on Man-Portable Air Defense Systems (MANPADS) such as the *Misagh-2*. The latter, specifically, have contributed to the creation of a distributed low-altitude interdiction zone, which proved particularly useful against drones and low-speed threats. Nevertheless, they have shown clear limitations against aircraft operating at high altitudes and equipped with advanced infrared countermeasures. Finally, alongside kinetic systems, the Islamic Republic has also developed EW capabilities, which it has demonstrated through jamming operations, particularly against unmanned platforms. However, these capabilities have proved limited, mainly due to their poor integration with radar systems and the C2 network. In this context, adversarial operations, characterized by a high degree of integration between ISR, EW, cyber capabilities and stand-off munitions, including loitering munitions, have further amplified these vulnerabilities, contributing to the degradation of communications and significantly

compromising the detection, tracking and engagement capabilities of the Iranian defense system.



Figure 31 – Illustration of a Khordad-3 system in operation.

Overall, the Iranian defense architecture has revealed significant weaknesses, attributable primarily to its systemic design rather than to the performance of individual systems. The first weakness concerns the incomplete integration between sensors, weapon systems, and C2 facilities. Indeed, although some systems are technologically advanced, the absence of a truly unified and resilient network has limited their actual effectiveness. In particular, the neutralization of the main nodes of the defensive architecture, such as long-range radars and C2 centers, led to a rapid fragmentation of the system, resulting in a loss of operational and coordination capabilities. A second critical issue concerned the vulnerability of the radars, which are often fixed or semi-fixed, and therefore easily detectable and neutralizable through the use of stand-off munitions. During high-intensity operations, in fact, such systems tend to be targeted in the early stages, which severely compromises their tracking capabilities and effectively renders interception systems blind. To these vulnerabilities are further added the limited redeployment capabilities and the insufficient adoption of effective tactical mobility concepts, which have

prevented the batteries from surviving in a contested environment. At the same time, Iranian defenses have struggled to counter the coalition's advanced jamming and SEAD/DEAD operations, which have degraded the electromagnetic spectrum and reduced the effectiveness of communications and sensors.

CONCLUSIONS

An integrated, multi-perspective analysis of the conflict reveals a complex operational landscape, in which the tension between technological superiority and asymmetric resilience is clearly evident. In this context, the conduct of the Israeli-US coalition has demonstrated unprecedented levels of excellence in terms of multi-domain integration, whilst the Islamic Republic has shown a remarkable capacity for adaptation, based on strategies of saturation, dispersion and cost containment.

In terms of targeting, first and foremost, the US approach, based on the Joint Targeting Cycle and the effectiveness of the F2T2EA chain, has demonstrated an unprecedented ability to dismantle the IADS architecture and C2 nodes of the enemy, whilst highlighting how the synchronization between the activities of USSPACECOM and USCYBERCOM can paralyze the response of a modern defense system. However, the almost total reliance on high-value stand-off munitions for the early stages of the campaign, whose stockpiles are slow to replenish, has helped to highlight the limits of Western industrial capacity. On the Israeli front, secondly, Operation *Roaring Lion* showcased the strengths of a doctrine based on speed of execution and the integration of fifth-generation sensors to carry out precision strikes, through which the IAF managed to seal off the entrances to the HDBT complexes at Parchin and Khojir. In contrast, the Iranian *True Promise IV* campaign transformed its technological inferiority into a doctrinal strength, using a mosaic defense and swarms of low-cost drones to impose a significant cost differential. Iran's main strength, indeed, laid in its ability to force coalition forces to deploy assets with a high unit cost to intercept a large volume of low-cost delivery systems. Ultimately, although the coalition achieved its intended tactical objectives by neutralizing Iran's naval capabilities and degrading its nuclear sites, this success came at the cost of a war effort that proved to

be financially unsustainable in the long term. The fundamental lesson of this conflict therefore lies in the realization that precision targeting and stealth capabilities cannot, on their own, lead to victory in a war of attrition against a highly resilient adversary, capable of operating under conditions of operational decentralization and able to saturate the battlefield with a significant numerical mass of real assets and decoys. In conclusion, the operational synergy between the United States and Israel ensured the neutralization of immediate strategic threats, but the resilience of Iran's decentralized structure and the use of air saturation tactics have highlighted that true victory is not measured solely in terms of targets destroyed, but rather in the industrial and logistical sustainability of the conflict itself.

With regards to the maritime dimension of the conflict, it is worth noting that it has confirmed, first and foremost, that the concept of sea control cannot be considered in isolation from the neutralization of the adversary's land-based and coastal capabilities. In this sense, the campaign against the Iranian navy demonstrated the effectiveness of cross-domain fire, as the integration between the CSG, submarine forces and land-based capabilities enabled naval units and coastal infrastructure to be struck with high precision. However, at the same time, the significant cost disparity between the advanced defense systems deployed by the coalition and the low-cost asymmetric threats employed by the Islamic Republic highlighted how even maritime dominance remains exposed to the structural vulnerabilities typical of asymmetric conflicts. In broader terms, the sea has emerged as the structural axis of Operation *Epic Fury*, assuming a role that goes far beyond that of a mere theatre of operations. This stems, on the one hand, from the centrality of the Strait of Hormuz, and, on the other hand, from its function as a global energy hub, which has made the area a point of friction between the Western logic of sea control and the Iranian strategy of sea denial.

Consequently, the maritime space has functioned not only as an operational environment, but also as a multiplier of the military, economic and political effects of the conflict.



Figure 32 – An F/A-18 Super Hornet taking off from a Nimitz-class aircraft carrier.

At the operational level, the Israeli-US coalition demonstrated an extremely high level of power projection capability. In particular, the simultaneous deployment of aircraft carriers, Aegis-equipped destroyers and submarine assets ensured overwhelming naval superiority, enabling the conduct of multidomain operations against naval, coastal and infrastructure targets. Furthermore, the integration of naval, air, land and space domains enabled the construction of a distributed and highly resilient kill chain, capable of striking targets both in port and on the open sea with great speed and precision. However, this superiority was accompanied by significant structural challenges. In particular, the naval campaign highlighted an extremely high consumption of advanced munitions, especially interceptors, as well as a growing dependence on logistical and industrial regeneration capabilities. Consequently, analysis of the first days of the conflict clearly showed that long-term sustainability represents one of the main

constraints of high-intensity naval operations. In this context, maritime dominance has amplified tensions already present in Western systems between immediate operational effectiveness and prolonged strategic sustainability. In parallel, the Iranian response has developed in line with a doctrine of sea denial, based on the combined use of naval mines, USVs, FACs, anti-ship missiles and coastal interdiction systems. Despite technological inferiority and the progressive erosion of its conventional capabilities, Tehran has nevertheless managed to exert significant pressure on global commercial traffic. In particular, the temporary closure of the Strait of Hormuz and the drastic reduction in trade flows had immediate effects on international energy markets, demonstrating how even militarily inferior actors can influence systemic dynamics by disrupting critical maritime infrastructure. Consequently, the conflict highlighted the profoundly hybrid nature of contemporary naval warfare, in which military, economic, and infrastructural dimensions overlap. In light of this, several key lessons have emerged. Firstly, the enduring effectiveness of asymmetric strategies in confined maritime environments has been confirmed, where low-cost systems can generate effects disproportionate to their intrinsic value. Secondly, cross-domain fire has taken on increasing significance, helping to redefine the traditional separation between land, air and naval domains, transforming the sea into a natural extension of multi-domain strike capabilities. Thirdly, the conflict has highlighted the structural limits to the sustainability of high intensity naval operations, particularly in relation to the availability of advanced munitions and the industrial capacity to replenish stocks. Finally, the decisive role of coalitions and political-military coordination in managing maritime security has become clear, as their absence or fragmentation can significantly reduce the effectiveness of strategic action.

With regard to the land-based dimension of the conflict, on the other hand, it must be emphasized that it did not take the form of

an alternative to the air and sea campaign, but rather as a possible selective and high-intensity extension of it. In this sense, the analysis conducted has highlighted how the ground option is not attributable to a logic of conventional invasion, but rather to a limited set of capabilities aimed at sustaining, amplifying or finalizing the effects of multi-domain maneuvers, which include deep special operations, CSAR missions, targeted raids, the temporary establishment of FARPs, and interdiction and sabotage operations against sensitive objectives. The episode involving the recovery of the WSO from the downed American *F-15E Strike Eagle* constitutes, in this sense, the main empirical evidence of the operational feasibility of a limited ground deployment and of the related methods of execution. Indeed, the mission demonstrated, on the one hand, the coalition's ability to rapidly generate a complex system of penetration, coordination and protection in a hostile environment; yet it also highlighted, on the other hand, that any ground operation deep behind enemy lines requires a critical mass of air assets and ISR, EW and logistical capabilities, sufficient to transform the action into a function dependent on multi-domain integration in accordance with the concept of joint forcible entry.



Figure 33 – Illustration of a C-130J on an improvised landing strip during an operation deep within enemy territory.

At the same time, the difficulties encountered during the withdrawal phase highlighted that the decisive factor is not so much access to the territory, but rather the sustainability of the operation over time and the ability to ensure the recovery of the forces deployed. In conclusion, the land domain emerged as a terminal component of the multi-domain campaign, characterized by high specialization but limited strategic autonomy. Operation *Epic Fury* thus confirmed that, in high-intensity and highly contested environments, the effectiveness of land maneuvers depends not so much on their scale, but rather on their functional integration with the air, maritime and cyber domains.

Finally, with regard to air and missile defense, a comparison of the three architectures analyzed has highlighted profoundly different approaches, reflecting not only technological differences but also distinct doctrinal and strategic frameworks. In particular, the US model is based on marked intelligence superiority and a high level of network integration, elements that enable a highly coherent operational framework and considerable effectiveness in terms of coordination and timeliness of intervention. However, this configuration also presents certain challenges, particularly regarding long-term economic sustainability and dependence on complex network infrastructures, which are potentially vulnerable in high-intensity conflict scenarios. The Israeli model, on the other hand, is characterized by a balanced combination of multi-layered defense and advanced threat discrimination capabilities, which allows for the optimization of available resources and an increase in the system's overall resilience. In doctrinal terms, whilst the US approach favors a defense-in-depth logic heavily centered on network integration, the Israeli one introduces elements based on selective interception and the efficient use of interceptors, so to limit cost asymmetry and ensure greater operational sustainability. In contrast, the Iranian model appears characterized

by a high internal heterogeneity and a significantly more limited level of integration, factors which reduce its effectiveness in high-intensity scenarios and in the presence of technologically advanced adversaries. Nevertheless, this configuration responded to a specific strategic logic, geared towards denying access and consistent with an asymmetric approach aimed at compensating for technological inferiority through the saturation and dispersion of defensive capabilities. Overall, it emerges that the effectiveness of a modern air defense system cannot be attributed to a single element, but rather to the balance between systems integration, economic sustainability, and operational resilience. From this perspective, the three models analyzed do not merely represent different technical-operational solutions, but embody distinct visions of contemporary air warfare, highlighting how defensive choices are closely linked to the strategic context, available resources and the political-military objectives pursued.

SCOPE	THE U.S. AND THE PERSIAN GULF STATES	ISRAEL	IRAN
Approach	Network-centric (IAMD)	Layered + selective	Incomplete A2/AD
Integration	Very high (sensor fusion)	Very high (centralised)	Limited
Sensors	SBIRS + multi-layer radar	Green Pine + EL/M-2084	Fragmented
C2	C2BMC + IBCS	Advanced Battle Management	Fragile

Levels	THAAD, Patriot, Aegis	Arrow, David's Sling, Iron Dome	S-300, Khordad, Tor
CAP	Defensive	Proactive	Limited
Anti-drone	Medium	High	Low
Effectiveness	70-85%	80-90%	Low
Strengths	Integration and networking	Selectivity and redundancy	Dispersion
Critical Issues	Costs + saturation	High costs	Poor integration

Figure 34 – Summary table of the main characteristics of the air defense architectures analyzed.

In light of the comparison between the models analyzed, it is possible to draw some general conclusions that enable a more systematic understanding of the dynamics of contemporary air defense. The conflict has, indeed, provided a particularly detailed empirical picture, highlighting the strengths and weaknesses of the various architectures employed and, at the same time, enabling us to outline the fundamental features of an ideal defensive configuration, built upon the lessons learnt in the field. A key element that emerges clearly, particularly in light of the difficulties encountered in the Iranian case, concerns the need to ensure a high level of interoperability between heterogeneous systems. The effectiveness demonstrated by the US and Israeli architectures highlights, under this point of view, that integration between sensors, launchers and C2 systems is an essential prerequisite for ensuring rapid response times and accurate decision-making processes. In this context, sensors play a central role: their layered deployment, ranging from satellite systems to various radar components, and their full integration within the C2 network are crucial for establishing a coherent operational framework and for

the overall success of defensive operations. Conversely, Iran's difficulties in keeping its radar capabilities operational and coordinated have highlighted how the loss or degradation of such nodes leads to a rapid deterioration of the entire system. A second crucial dimension concerns the need to differentiate interceptors not only by altitude and range, but also in terms of cost. As emerged during the conflict, one of the main limitations of the most advanced defenses is the economic asymmetry between relatively inexpensive offensive platforms, in particular swarms of OWA UAVs, and high-cost interceptors. In this sense, an effective air defense system must adopt a multi-layered approach from an economic perspective as well, involving the use of diversified solutions. The introduction of low-cost interceptors, such as drones dedicated to engagement, already tested in other operational contexts such as the Russia-Ukraine conflict, represents a possible response to this critical issue, allowing the most sophisticated systems to be reserved for threats of greater complexity and value.

However, whilst the adoption of less expensive systems is necessary, it does not in itself appear sufficient to resolve the problem. The conflict has, in fact, highlighted a further key factor: the industrial sustainability of air defense. In high-intensity warfare scenarios, the ability to maintain an integrated, multi-layered defense system depends directly on both the availability of stocks and the national production capacity. In this context, industrial models based on just-in-time principles, widespread in many Western countries, have proved inadequate for sustaining high and prolonged rates of consumption of interceptors and munitions. It follows that a truly effective air defense in the contemporary context must be based not only on technological integration and operational superiority, but also on a robust defense industrial base capable of ensuring large-scale production and logistical continuity. In conclusion, the experience of the conflict demonstrates that superiority in modern air defense

does not depend exclusively on the quality of individual systems, but rather on the ability to integrate them within a resilient, sustainable and scalable network, capable of operating effectively in scenarios characterized by complex and high-intensity threats. From this perspective, strategic competition extends beyond the purely technological dimension, encompassing the ability of actors to sustain the effectiveness of their defensive systems over time in an operational environment marked by saturation, industrial competition and growing complexity. It follows that air defense is increasingly taking the form of a complex system, in which the technological, organizational, and industrial dimensions are deeply interdependent.

Overall, the conflict has highlighted how technological superiority, whilst remaining a decisive factor, is not in itself sufficient to guarantee victory in scenarios characterized by asymmetric attrition. The resilience of the Iranian structure, combined with the systematic use of numerical superiority and low-cost delivery systems, has demonstrated that operational success depends increasingly on the ability to sustain the war effort over time. From this perspective, the disproportion between the consumption of high-cost systems and the time required for industrial replenishment represents a strategic vulnerability for technologically advanced actors. Consequently, modern warfare is no longer fought solely on the basis of technological superiority or the precision of weapon systems, but on the ability to effectively integrate different operational dimensions within a resilient, scalable and sustainable architecture. The true measure of victory lies, therefore, not only in the neutralization of targets, but in the ability to maintain, over time, a balance between operational effectiveness, industrial sustainability and strategic adaptability in an environment characterized by saturation, technological competition and growing multi-domain complexity. In conclusion, the fundamental lesson emerging from the conflict lies in the

realization that technological excellence is not enough to guarantee victory and that resilient adversaries can exploit this aspect by reducing the level of confrontation to a war of asymmetric attrition. The resilience of Iran's decentralized structure and the systematic use of numerical superiority have, as a matter of fact, demonstrated that operational success is inextricably linked to industrial sustainability and logistics. The disproportion between wartime consumption of costly delivery systems and annual replacement rates represents a strategic vulnerability that necessitates a thorough review of the production models adopted. Ultimately, victory is measured not only by the number of targets neutralized, but also by the ability to sustain, over time, an integrated and resilient defensive and offensive architecture capable of absorbing and neutralizing multi-vector saturation strategies enabled by the dispersion of threat sources across a wide theatre. While Operations *Epic Fury* and *Roaring Lion* thus demonstrate, on the one hand, the overwhelming firepower and density enabled by the multi-domain implementation of a highly technological kill chain, which is central to dismantling A2/AD bubbles and pursuing, with high precision, extensive lists of planned targets and opportunities, on the other hand they also reveal the challenges posed by creating the conditions necessary to achieve a strategic outcome against a prepared, resilient near-peer competitor ready to exploit the factors of space and time to impose an asymmetric balance in hostilities.

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