IJ-REPORTIKA

THE DEFECTIVE CHINESE WEAPONS (PART 2)

The Illusion of Deterrence:
A Failure-Based Scrutiny of Global Arms Exports

Global military power is measured not just by quantity, but by reliability.
How often do these weapons really fail?

Estimated Failure / Underperformance Rate of Exported Systems

Country	Failure Rate
China	30%–40%
Russia	20%–30%
France	5%–10%
United States	5%–8%

China: 30%–40% Failure Rate

The High Cost of Cheap Defence

Quality Issues, Crashes & Malfunctions Undermining Global Stability

Contents

The Defective Chinese Weapons (Part 2)

The Illusion of Deterrence: A Failure-Based Scrutiny of Global Arms Exports

Introduction

In the global arms market, power is often projected through numbers: export volumes, technological claims, and battlefield narratives. China, now among the world's top arms exporters, has leveraged this perception by positioning its weapons as cost-effective alternatives to Western systems. However, beneath this narrative lies a growing body of evidence that raises serious concerns about reliability, performance, and long-term operational viability.

This report shifts the focus from what is promised to what actually performs. It investigates a critical but underexamined dimension of modern warfare: failure rates of exported weapons systems. From malfunctioning fighter jets and grounded drone fleets to ineffective missile systems and "blind" radar networks, Chinese-origin military hardware has repeatedly demonstrated patterns of underperformance across multiple countries, including Pakistan, Bangladesh, and Iran.

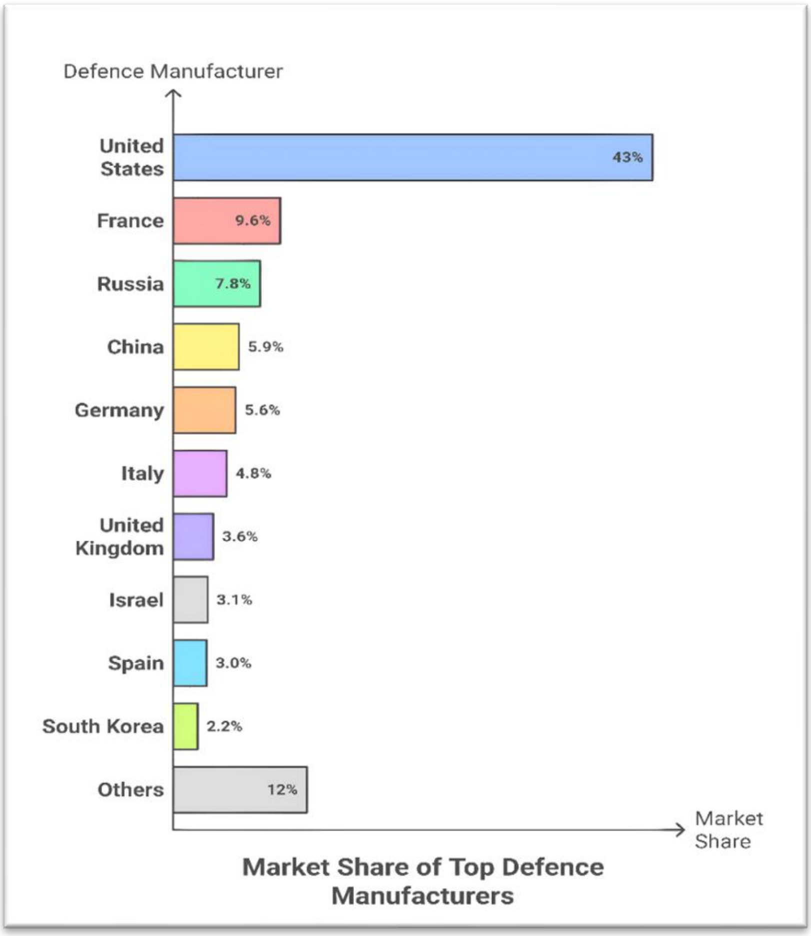


Figure 1 The countries with the maximum percentages of weapon exports (Rounded off)

Through verified data, incident records, and defence analyses, this study uncovers the scale and frequency of these failures, mapping how Chinese systems have performed in real-world conditions, often outside combat, during routine operations, training exercises, or live conflict scenarios. More importantly, it places these findings in a global context by comparing China's performance with that of leading arms exporters such as the United States, France, and Russia.

The contrast is striking. While Western systems maintain relatively low failure rates supported by mature maintenance ecosystems, Chinese exports show significantly higher rates of technical faults, operational breakdowns, and sustainment challenges. This report quantifies those gaps, offering a comparative assessment of reliability across major exporting nations.

At its core, this investigation challenges the illusion of deterrence built on affordability. It reveals a harsher reality: in modern warfare, the true cost of a weapon is not its purchase price, but its ability to function when it matters most.

In an era of expanding militarization and record-breaking defence budgets, understanding how and why weapons fail is as important as knowing who sells them-and to whom.

Chinese Defence Exports

China accounted for 5.9% of global arms exports in 2020–2024, making it the fourth-largest arms exporter globally. Chinese arms exports focus primarily on combat aircraft, armed drones (UAVs), surface-to-air missile systems, naval vessels, armoured vehicles, artillery, and guided missiles. Unlike most Western suppliers, China has become a major exporter of armed unmanned aerial systems, often filling gaps where US or European suppliers impose restrictions.

China's arms industry is dominated by large state-owned defence conglomerates, including Aviation Industry Corporation of China (AVIC) (combat aircraft and UAVs), China North Industries Group (NORINCO) (armoured vehicles, artillery, and missiles), China Aerospace Science and Industry Corporation (CASIC) and China Aerospace Science and Technology Corporation (CASC) (missiles and air defence systems), and China State Shipbuilding Corporation (CSSC) (major warships and submarines). These entities operate under close state control and align exports with China's broader strategic and diplomatic objectives.

China's Top Defence Manufacturers

China's arms industry is dominated by state-owned giants that rank among the world's largest producers:

AVIC – Top 10 globally; ~$25–30B defence revenue

NORINCO – Top 10–15; ~$20B+ revenue

CASC & CASIC – Leading missile/air defence firms; top 20 globally

CSSC – World's largest naval shipbuilder

Insight: These firms operate under direct state control, aligning arms exports with China's strategic objectives.

Global Share and Export Trends

China's share of global arms exports in 2020–2024 was slightly lower than in 2015–2019, despite Beijing's stated ambition to expand its role in global arms markets. While China has invested heavily in modernising its defence industry, many of the world's largest arms importers continue to avoid Chinese major weapons systems, largely for political, interoperability, and trust-related reasons. Concerns over strategic dependence, sanctions exposure, technology reliability, and compatibility with NATO-standard systems have limited China's penetration into high-end Western-aligned markets.

Performance of Chinese Defence Exports in Operational Use

Chinese defence exports such as the **Wing Loong series UAVs and CH-series drones** have shown operational effectiveness in asymmetric warfare environments, particularly in the Middle East and North Africa despite having a number of issues highlighted in this report.

The **Wing Loong II**, exported to countries like the **UAE and Egypt**, has been actively used in **Libya's civil conflict and Yemen operations**, where it provided persistent surveillance and strike capability at low cost.

Similarly, the **CH-4 drone**, deployed by **Iraq**, has been used in counter-ISIS operations for reconnaissance and targeted strikes.

These systems are widely regarded as China's better exports due to their affordability, ease of deployment, and operational uses.

Chinese arms exports are highly regionally concentrated:

- Asia & Oceania: 77%
- Africa: 14%
- Other regions: Marginal shares

China delivered major arms to 44 states in 2020–2024. However, exports were extremely concentrated, with 63% of total Chinese arms exports going to a single country-Pakistan.

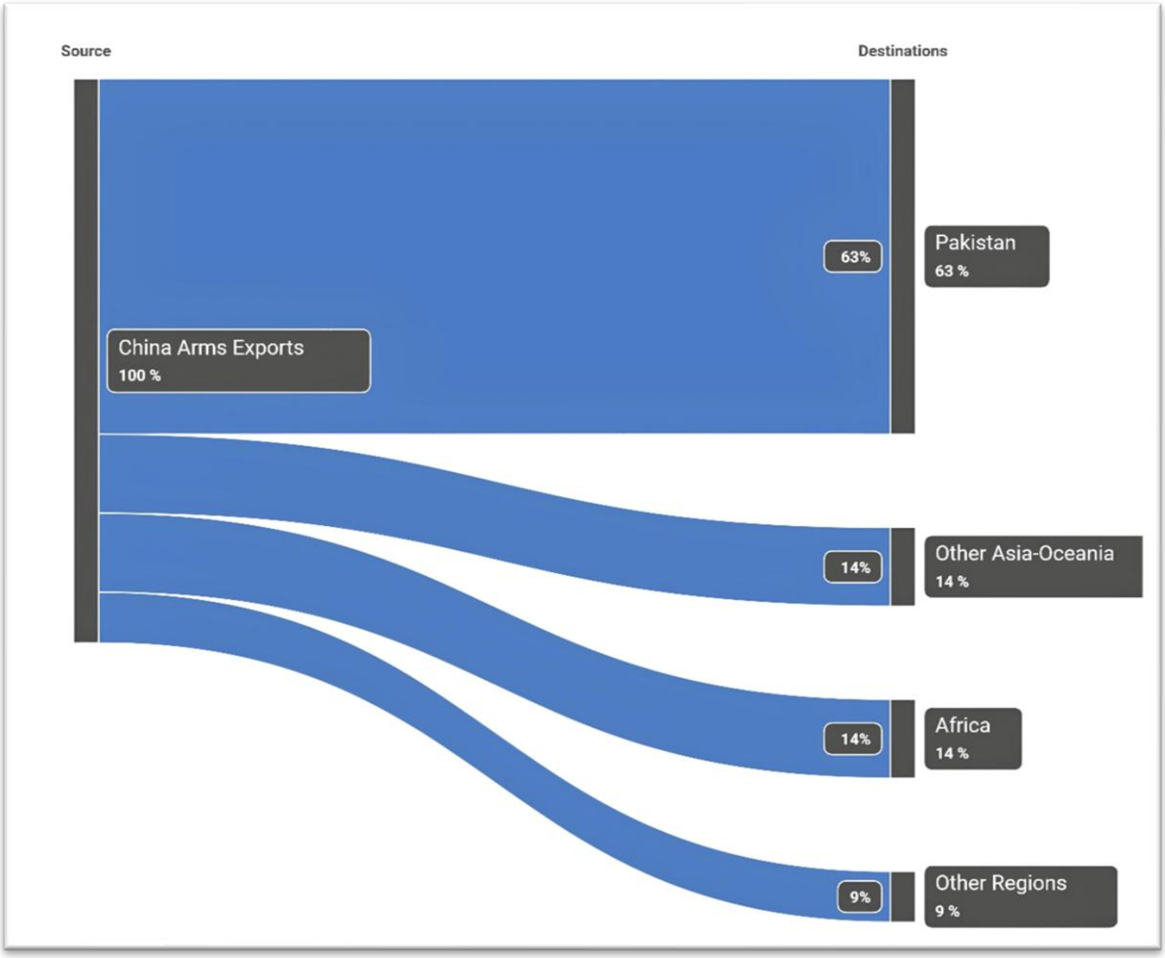


Figure 2 Distribution of China's Arms Exports by Region and Key Recipient

This level of dependence on one recipient is unmatched among major arms exporters and represents a structural vulnerability in China's export profile.

Documented Defective Chinese Weapons

The earlier report, "The Defective Chinese Equipment & Weapons" by IJ-Reportika, documented multiple cases of operational failures, maintenance breakdowns, and after-sales support deficiencies associated with Chinese-exported military systems across several recipient states. Drawing on publicly available records and field-level reports, it highlighted how a range of platforms, including naval vessels, aircraft, drones, and armored systems—have, in multiple instances, underperformed in real operational environments, raising broader questions about reliability and sustainment.

Building on those findings, Part 2 of this investigation expands the scope beyond individual case studies to examine systemic patterns across China's defense export portfolio. Rather than isolated incidents, the focus here is on recurring themes emerging across multiple regions and platforms, including performance inconsistencies, logistical constraints, and limited long-term technical support frameworks.

Evolution of China's Defence Manufacturing Industry

The development of China's defence manufacturing has evolved through distinct phases since 1949. Initially, the industry was **Soviet-modelled**, focusing on basic licensed production of outdated systems and centralized state control.
From the late 1970s under Deng Xiaoping, reforms shifted the sector toward "**military-civil fusion**," prioritizing economic modernization and dual-use industrial capacity.
Since the 1990s, major restructuring created **large state-owned defence conglomerates**, aimed at improving efficiency, R&D, and export capability.
In the 21st century, the industry has rapidly advanced toward indigenous high-tech systems such as stealth aircraft, missiles, and naval platforms, supported by heavy investment and PLA modernization goals.

Global Patterns of Failure and Key Systemic Issues

Across multiple recipient states and diverse operational environments, a consistent set of recurring issues emerges from Chinese-origin defence platforms. While individual cases vary in scale and context, the failures documented in this investigation point toward broader structural challenges affecting performance, sustainment, and lifecycle reliability of exported systems.

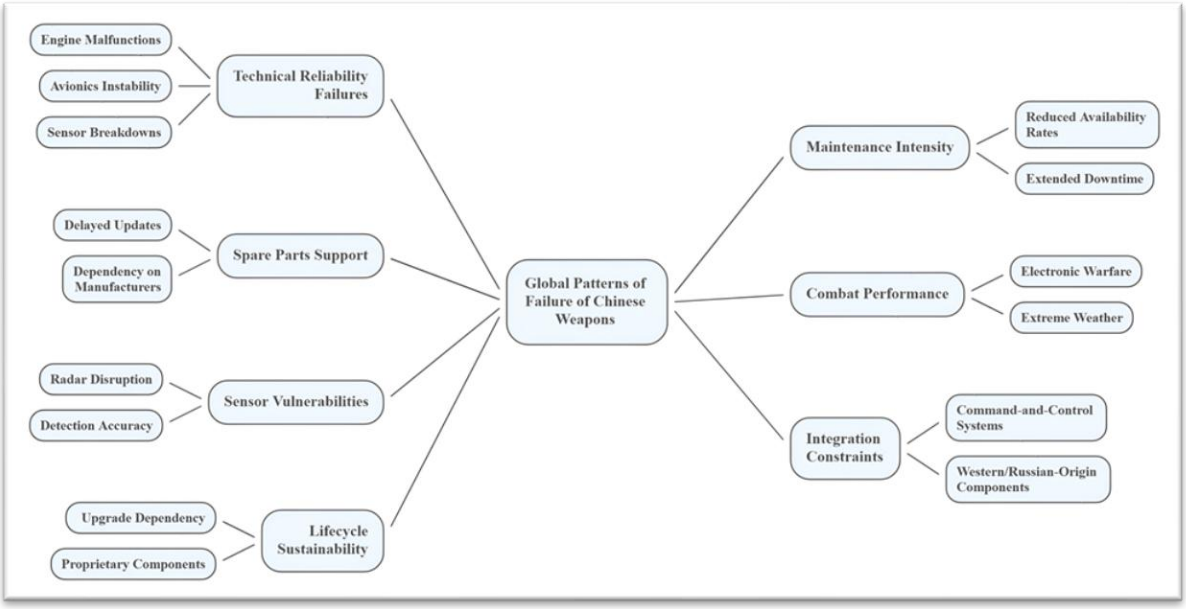


Figure 3 Global Patterns of Failure and Key Systemic Issues in Chinese Weapon Systems

1. Recurring Technical Reliability Failures

A significant number of platforms across air, land, and naval domains have reported early-life technical faults, including engine malfunctions, avionics instability, sensor breakdowns, and fire-control system errors. These issues often appear shortly after induction, suggesting challenges in quality assurance, system integration, or adaptation to diverse climatic and operational conditions.

2. Maintenance Intensity and Low Operational Readiness

Many systems require high-frequency maintenance cycles, resulting in reduced availability rates. Aircraft, drones, and naval vessels in particular have been reported to spend extended periods grounded or docked due to recurring technical faults and limited spare-part ecosystems.

3. Spare Parts and After-Sales Support Gaps

A recurring concern across multiple countries is the delayed or inconsistent supply of spare parts, software updates, and technical assistance. In several documented cases, recipient states have reported extended downtime due to dependency on Chinese manufacturers for even routine maintenance components.

4. Limited Combat and Stress-Environment Performance

Several systems demonstrate performance degradation under high-intensity operational conditions, including electronic warfare environments, extreme weather, or sustained combat stress. Reported issues include radar disruption, missile guidance inconsistency, and UAV vulnerability to jamming.

5. Sensor, Radar, and Electronic Warfare Vulnerabilities

Across multiple platforms, radar and sensor systems have shown susceptibility to interference, reduced detection accuracy, and inconsistent tracking performance. These weaknesses are particularly evident in air defence and naval surveillance systems.

6. Integration and Compatibility Constraints

Export variants often require significant adaptation to integrate with non-Chinese command-and-control systems, Western-origin components, or legacy platforms. This has resulted in configuration mismatches and reduced system efficiency in joint operational environments.

7. Lifecycle Sustainability Concerns

Beyond initial procurement, long-term sustainability remains a persistent challenge. High dependency on original manufacturers for upgrades, software patches, and proprietary components has constrained indigenous maintenance capabilities in several recipient countries.

Illustrative Examples of Reported Systemic Issues

Across multiple recipient states, recurring **reliability issues** were observed in systems such as Pakistan's JF-17 and F-7 fighter aircraft, Bangladesh's F-7BGI fleet and MBT-2000 tanks, and Pakistan Navy's F-22P frigates, where early **technical faults and system malfunctions** reduced operational performance.

Maintenance-heavy platforms such as Pakistan's F-7 fleet and CH-4 drones deployed in Iraq and Algeria frequently required repeated servicing and suffered from **low availability rates**.

Spare parts and after-sales support gaps were reported in Bangladesh's armored and naval systems, including MBT-2000 tanks and corvettes, leading to extended downtime.

Limited combat effectiveness was highlighted in systems such as Iran's HQ-9B air defence network during the 2026 conflict and CH-4 drones operating in contested environments.

Sensor and radar vulnerabilities were evident in Pakistan's FM-90 SAM system and Bangladesh's naval radar suites, while integration constraints were observed in Pakistan's J-10C and Bangladesh's mixed-origin air defence architecture.

Lifecycle sustainability challenges were reflected in Myanmar's JF-17 fleet and UAV operators such as Nigeria and Iraq, where long-term operational reliability and supportability remained persistent concerns.

To further contextualize these patterns, the following country-wise profiles present documented experiences from selected recipient states. These cases collectively illustrate how operational challenges have manifested across diverse military environments, ranging from South Asia to the Middle East and Africa. Together, they provide a structured examination of reported reliability concerns, maintenance constraints, and lifecycle sustainment gaps within Chinese-origin defence systems deployed globally, offering a clearer understanding of how these systemic issues translate into real-world operational impact.

Pakistan

Pakistan, a long-standing ally of China since 1951, has heavily relied on Chinese arms to bolster its military capabilities, especially following U.S. embargoes post the 1965 India-Pakistan war. While this partnership has enabled joint projects like the JF-17 fighter jet and Al-Khalid tank, the quality of Chinese equipment has often come under scrutiny, with numerous reports of defects, operational failures, and combat vulnerabilities leading to significant setbacks for the Pakistani armed forces.

Weapon Name	Weapon Type	Year Ordered	Total Number
J-10C	Fighter Aircraft	2021	36
FN-6 Missile	Portable SAM	2020, 2017, 2015, 2009	1,997
HQ-9 SAM	SAM System	2019	1
HQ-9	SAM – Missile	2019	70
CH-4A	MALE Drone	2019	10
PLC-181	155 mm SPG	2018	236
Wing Loong 2	Armed UAV	2018	48
Wing Loong 1	Armed UAV	2015	5
JF-17	Fighter Aircraft	2018, 2017, 2012, 2011, 1999	188
YLC-18A Gap Filler	Air Search Radar	2018	5
JY-27A	Air Search Radar	2018	1
LY-80 (HQ-16)	SAM – Missile	2017, 2014	500
LY-80 SAM System (HQ-16)	SAM System	2014	3
IBIS 150	Air Search Radar	2014	8
FM-90 SAMS	SAM System	2013	10
FM-90	SAM Missile	2013	400
CH-3	Armed UAV	2011	50
HQ-7 (Crotale)	SAM Missiles	2005	100
YLC-2A Radar	L-band Air Search Radar	2003	1
YLC-6 Radar	Air Search Radar	2003	10

Table 1 Chinese Air & Land Warfare Arms Transfers to Pakistan (2000–2025) [Source: SIPRI Arms Transfer Database]

JF-17 Thunder Jets

Jointly developed with China, the JF-17 has been a cornerstone of PAF's fleet, with over 100 units in service by 2025. Here is a detailed overview of the issues:

Engine Reliability Problems

- The Klimov RD-93 engine, sourced from Russia, has been a major concern for PAF.
- Reports indicate frequent engine-related malfunctions and mid-air failures, leading to multiple crashes.
- Example: On June 5, 2024, a JF-17 Block 2 crashed near Jhang due to engine failure.
- Engine overhauls are complicated by limited access to Russian parts, especially post-Ukraine war sanctions.

Avionics and Systems Glitches

- The JF-17's avionics suite (including radar and weapon integration) has suffered from reliability issues.
- Pilots have reportedly complained about intermittent radar performance and electronic system failures, especially under extreme conditions.

High Maintenance Burden

- Compared to Western counterparts, the JF-17 requires frequent maintenance cycles, reducing aircraft availability rates.
- Lack of indigenous engine production capability has made Pakistan reliant on external support.

Crash Record in Pakistan

- At least 6 known crashes of JF-17s in Pakistan have been reported due to technical malfunctions, primarily engine and system failures.

Crash Date	Type	Operator	Location
14 Nov 2011	PAC JF-17 Thunder	Pakistan Air Force	Attock District, Punjab, Pakistan
27 Sept 2016	PAC JF-17 Thunder	Pakistan Air Force	Arabian Sea
15 Sept 2020	PAC JF-17 Thunder	Pakistan Air Force	Pindigheb, Attock District
6 Aug 2021	PAC JF-17B	Pakistan Air Force	Near Attock
13 Dec 2021	PAC JF-17 Thunder	Pakistan Air Force	Attock District
5 Jun 2024	PAC JF-17 Thunder	Pakistan Air Force	Jhang District

Table 2 Details of Crashes of JF-17: A record of technical malfunctions and crashes involving the JF-17 in Pakistani service

Figure 4 The PAF fighter jet crashed near Attock during a training mission due to a technical problem reported by Brazilian Media (Source : Cavok Media)

- Reports suggest that Indian Air Force missiles shot down two Chinese made JF-17s during India-Pakistan clashes in May 2025, following a terrorist attack in India. However, Pakistan has denied these claims and issued counter-statements.

Figure 5 JF17 crash near Jhang due to Engine Failure reported (Source: Eurasian Times)

Structural and Fatigue Concerns

- While not officially acknowledged, there are unverified reports of airframe stress and fatigue, especially in earlier Block 1 units which were not designed for high-load combat operations.

Export-Driven Modifications Affect Local Use

- Efforts to enhance the JF-17 for export markets (like JF-17 Block III) have at times taken priority over resolving legacy issues in PAF's own fleet.

Figure 6 Chinese JF-17 riddled with issues in Pakistan (Photo by Stephan De Bruijn)

Export Woes: Grounded Fleets and Reputational Injury

The first alarm bell for the JF-17's export ambitions sounded in Myanmar, and it did so publicly, not quietly. The Irrawaddy's headline "Technical Problems Ground Myanmar's JF-17 Fighter Jets Bought From China" captured the scale of the crisis: an entire fleet rendered non-operational within years of induction due to structural cracking, avionics instability, and stubborn engine defects. Instead of routine upgrade cycles, Myanmar found itself in emergency troubleshooting mode.

Technical Problems Ground Myanmar's JF-17 Fighter Jets Bought From China

By The Irrawaddy — November 25, 2022 in Burma, Factiva, News Reading Time: 3 mins read 0 0 AA

Figure 7 Reported Technical Issues Grounding Myanmar's JF-17 Fleet, as Covered by Leading Myanmar Media Outlet

Matters worsened when Defence Mirror published the blunt assessment "Pakistani Engineers in Myanmar to Fix 'Junk' JF-17 Jets", reporting that teams dispatched from Pakistan were attempting not standard maintenance, but fundamental remediation, incompatible with how a frontline fighter should function. Such coverage not only documented technical failings; it signalled to the global market that the aircraft required caretaker support unavailable to most small air forces.

Pakistani Engineers in Myanmar to Fix "Junk" JF-17 Jets

Defensemirror.com Bureau 07:57 AM, March 16, 2023 6325

Figure 8 Matters worsened when Defence Mirror published the blunt assessment "Pakistani Engineers in Myanmar to Fix 'Junk' JF-17 Jets",

Nigeria's experience reinforced the reputational slide. Defence reporting chronicled radar outages, unreliable weapons integration, and inconsistent operational readiness, ultimately influencing Abuja's pivot toward platforms such as the M-346FA, whose Western avionics architecture and proven support chain offered confidence the JF-17 could not. The message was unmistakable: even politically aligned or cash-constrained air forces were weighing sustainability above sticker price.

In defence procurement, reputation is currency. Once multiple operators publicly demonstrate reluctance and newsrooms begin describing a fighter as grounded, unreliable, or in need of rescue teams, affordability ceases to be a competitive advantage. The JF-17's export headwinds therefore stem not from geopolitics, but from the cold arithmetic of risk: buyers cannot afford a fighter that cannot afford to fly.

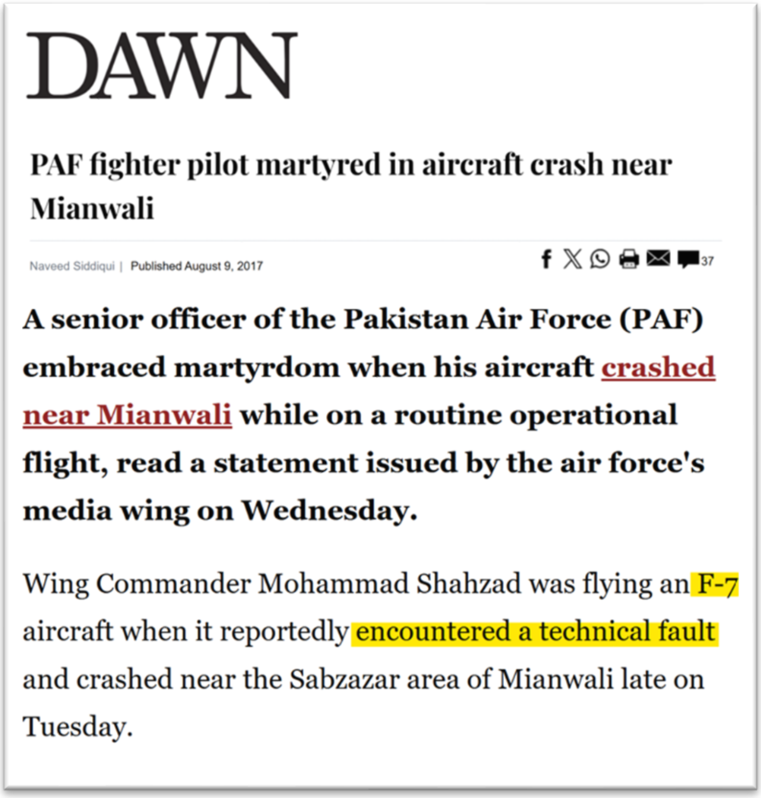
F-7 Fighters

The Pakistan Air Force (PAF) has operated Chinese-made F-7P and F-7PG fighter aircraft since the 1980s and early 2000s, using them in roles ranging from training to air defence. These jets are export variants of China's Chengdu J-7 series, itself born from Beijing's 1960s effort to reverse-engineer the Soviet MiG-21 after incomplete technical transfers left Chinese engineers to reproduce missing components and systems for local production. While the J-7/F-7 became the backbone of several developing air forces due to its affordability, its aging design and service-life challenges have produced persistent maintenance, reliability, and operational limitations in PAF service.

Figure 9 F-7 Crash reported by aeroflap (Source: AeroFlap)

Maintenance and Reliability Challenges

- **High Maintenance Demands:** The F-7P's WP7B engine requires overhauls every 200 flight hours, necessitating shipment to Karachi for servicing. Additionally, the airframe mandates a complete rebuild after 800 flight hours, a process taking approximately 30 weeks and involving extensive disassembly and component replacement.
- **Infrastructure Adaptations:** To support the F-7 fleet, Pakistan established overhauling facilities domestically. However, initial challenges included adapting existing test beds designed for older aircraft, leading to the need for locally designed solutions to accommodate the F-7's requirements.



DAWN

PAF fighter pilot martyred in aircraft crash near Mianwali

Naveed Siddiqui | Published August 9, 2017

A senior officer of the Pakistan Air Force (PAF) embraced martyrdom when his aircraft crashed near Mianwali while on a routine operational flight, read a statement issued by the air force's media wing on Wednesday.

Wing Commander Mohammad Shahzad was flying an F-7 aircraft when it reportedly encountered a technical fault and crashed near the Sabzazar area of Mianwali late on Tuesday.

Figure 10 F7 crash reported by Pakistani Media due to Technical Fault

Crash Record in Pakistan:

Over the years, the PAF has experienced multiple incidents involving F-7 variants. Following is the list (non-exhaustive) of the same:

Crash Date	Type	Operator	Location
25 May 2017	F-7PG	Pakistan Air Force	Near Mianwali, Punjab
25 Jan 2012	FT-7P	Pakistan Air Force	Near Mianwali, Punjab
8 Feb 2012	F-7PG	Pakistan Air Force	Near Pishin, Balochistan
24 Nov 2015	FT-7PG	Pakistan Air Force	Near Kundian / PAF M.M. Alam Base, Punjab
7 Jan 2020	FT-7 (often reported as FT-7PG)	Pakistan Air Force	Near Chah Miana, Mianwali District, Punjab
5 Sept 2007	F-7PG	Pakistan Air Force	Southwestern Balochistan
20 Jul 2000	F-7P	Pakistan Air Force	Dera Ismail Khan, Khyber Pakhtunkhwa

Table 3 Incident History of F-7 Variants in Pakistan: A non-exhaustive list of crashes involving F-7P and F-7PG aircraft since 2000

Figure 11 PAF jet F-7PG crashes while on routine training near Mianwali, May 2017 (Source : Dawn News)

Figure 12 PAF trainer aircraft FT-7P crashed in January 2020

While the F-7P and F-7PG have been integral to the PAF's operations, they present several challenges related to maintenance intensity, operational limitations, and safety concerns. These factors have contributed to discussions within the PAF regarding fleet modernization and the potential phasing out of older aircraft in favor of more advanced platforms.

J-10 Fighters

The Chengdu J-10, nicknamed Vigorous Dragon, is a Chinese single-engine, multirole fighter designed with a delta wing and canard layout. Built by Chengdu Aircraft Corporation for the PLA Air Force, it is capable of speeds up to roughly Mach 1.8 and serves as China’s primary modern lightweight fighter. The aircraft is also exported to Pakistan, where it forms a key component of the PAF’s frontline fleet. Pakistan acquired J-10CE fighters in 2022, with around 20 in service and 36 more ordered. The Pentagon’s 2025 China Military Power Report confirms the delivery of 36 Chinese J-10C fighters to Pakistan-marking a major post-India-Pakistan 2025 clashes shift in South Asia’s air power balance as Beijing strengthens Islamabad’s capabilities with advanced platforms and PL-15 missiles.

Mechanical and Engine Failures: Our investigation revealed that the Pakistan Air Force (PAF) sidelined J-10C and JF-17 Thunder jets during a counterinsurgency operation due to mechanical and engine issues.

Ejection Seat Concerns: In July 2024, PAF faced challenges fitting British Martin-Baker ejection seats on J-10C jets due to U.S. restrictions on China, forcing reliance on Chinese-made ejection seats, which were described as "unreliable" by aviation experts.


CNN World Africa Americas Asia Australia China Europe India Middle East More NEW Watch

Horrific crash kills Yu Xu, 1st woman to fly China's J-10 fighter

By Brad Lendon, CNN
3 min read · Updated 6:45 PM EST, Mon November 14, 2016

Remembering China's first female jet pilot
01:14

(CNN) — One of China's first female fighter pilots and a member of the country's air force aerobatics team was killed in a training accident over the weekend, according to Chinese state-run media.

Capt. Yu Xu, 30, died Saturday during a routine training flight with the aerobatics team, according to the reports.

Figure 13 Horrific Crash of J-10 reported by CNN (https://www.cnn.com/2016/11/14/asia/china-woman-fighter-pilot-killed)

The J-10 emerged in the 1980s as China's answer to Western fourth-generation fighters like the F-16 and MiG-29, designed to replace obsolete J-7s and J-8s and build the foundation of a modern PLAAF. Yet its evolution shows how China was learning while building: the fighter's most visible weakness—the constantly redesigned air intake across the A, B and C variants—reveals aerodynamic immaturity the country was still working to overcome. Early reliance on Russian AL-31 engines, originally intended for twin-engine Su-27s, further underlined Beijing's technological gaps and introduced reliability risks that Pakistan inherited along with the aircraft.

While the J-10's NATO-standard pylons and 11-hardpoint capability give Pakistan flexibility, avionics upgrades have been uneven—mechanically scanned radar in the J-10A, PESA in the B model and AESA only in the newest J-10Cs, leaving most of China's fleet stuck behind the technological curve. Analysts note that the J-10's long-term growth ceiling remains limited next to heavier platforms such as the J-11 or stealth FC-31, just as the US moves F-16s aside for the F-35. Its strengths shine at standoff ranges using powerful missiles like the PL-15 rather than in close-combat dogfights, reflecting aerodynamic compromises and a single-engine layout.

Despite its developmental flaws, the J-10C has proven to be a major leap in China's fighter evolution-combining AESA radar, modern avionics and long-range missile capability into a single-engine platform that finally gives Pakistan a credible counter to frontline fourth-generation fighters in the region.

F-22P (Zulfiqar-class) Frigates

Pakistan Navy acquired four F-22P frigates between 2009 and 2013, tailored for multi-mission roles. However, soon after commissioning, major equipment, weapons, and sensors were found to be either non-functional or operating at reduced capacity, severely hampering their operational readiness. There are no specific reports of these frigates being shot down or direct combat losses, but their defective systems likely compromised their effectiveness in potential engagements.

Figure 14 F-22P (Zulfiqar-class) Frigates

Engineered for Failure: Propulsion Woes Cripple Pakistan Navy's Frigates and Maritime Reach

Figure 15 Sunday Guardian on Frigates in Pakistan (Link https://sundayguardianlive.com/news/engineered-for-failure-propulsion-woes-cripple-pakistan-navys-frigates-and-maritime-reach-134866/)

Figure 16 Chinese Frigates riddled with flaws covered by CRUX (Link: https://www.youtube.com/watch?v=9eszQ1hJF3Q)

Defective Missile Systems:

- The FM90 (N) missile system's imaging device suffers from an incorrect display, preventing accurate target locking for surface-to-surface and surface-to-air engagements. This renders the frigates ineffective in their intended air defence and interdiction roles. It compromises Pakistan's ability to protect naval forces or engage hostile combatants, a critical deficiency for multi-mission operations.

Malfunctioning Sensors:

- The IR17 infra-red sensor system and SR60 radars (plagued by electromagnetic compatibility/interference (EMC/EMI) issues), essential for air and surface surveillance, exhibit performance glitches, particularly during high-power transmissions. It limits the frigates' ability to detect and track threats, undermining convoy protection and patrol missions.

Engine Failures:

- All four frigates experience low engine speeds due to high exhaust temperatures, affecting diesel engines 3 and 4 across the fleet. This leads to crankshaft and liner degradation, lube oil issues, and vibration isolator deterioration.
- It reduces operational speed and reliability, increasing the infrared signature and making the ships more detectable, with potential for engine overhauls needed sooner than expected.

Sonar System Defects:

- The ASO-94 Sonar system on PNS Aslat (PNS Aslat (FFG-254) is a F-22P Zulfiquar-class guided missile frigate currently in active service with the Pakistan Navy since her commission in 2013) has faulty computing units, impairing underwater detection capabilities. The ASO-94 sonar system on PNS Zulfiquar reportedly produces false underwater targets due to excessive self-noise, degrading tracking accuracy and increasing vulnerability to hostile submarine detection and attack.

- It hampers anti-submarine warfare and heliborne operations, critical for the frigates' multi-mission profile.

Radar Performance Issues:

- The SR-47 BG Search Radar on PNS Aslat underperforms and has been repaired using cannibalized parts from other F-22P ships, indicating a lack of spare parts and ongoing reliability problems.
- It disrupts consistent surveillance and tracking, leading to operational downtime and mission disruptions.

Gun System Malfunctions:

- The AK-176M 76 mm main gun on PNS Zulfiquar has experienced repeated mechanical and electrical failures, including stabilizer and control-unit malfunctions, degrading accuracy and firing reliability.
- These failures compromise both offensive firepower and last-ditch air-defence capability, with Pakistan Navy reports to the Chinese manufacturer yet to receive a substantive response.

Structural and Operational Downtime:

- The HP5 stabiliser gyro on PNS Saif (FFG-253), (a frontline Zulfiquar-class frigate commissioned in 2010), has been faulty since induction due to defective gimbal assembly motors, causing excessive roll and affecting safe berthing and maneuvering.
- The unresolved stabilizer defect has forced the Pakistan Navy to restrict the vessel's deployment and incur repeated operational downtime, with no confirmed repair or replacement from the Chinese manufacturer to date.
- Disrupts mission schedules and reduces the fleet's availability for essential roles like Exclusive Economic Zone (EEZ) protection.

Lack of Maintenance Support:

- The Pakistan Navy has sought compensation and repairs from Chinese manufacturers (Hudong-Zhonghua Shipbuilding and China Shipbuilding Trading Company) due to lost operational time, but resolution remains pending.

CH-4B UAVs

The Pakistan Army Aviation Corps received its first batch of five CH-4B drones in early 2021, with more ordered for reconnaissance and strike roles. We found that the fleet was in disarray, with Chinese company ALIT unable to maintain them, citing incidents of cracks and broken parts.

Figure 17 Chinese CH-4B drones riddled with issues in Pakistan

Mechanical and Structural Defects: Inspections by the Pakistan Army revealed multiple mechanical issues in the CH-4B drones manufactured by ALIT a China based firm:

- A broken exhaust manifold in one unit.
- A cracked turbocharger in another.
- Problems within the muffler spot connected to the engine mount.

Avionics and Navigation Failures: Pakistan Army’s CH-4B drones have suffered from critical failures, including GPS malfunctions, non-functional electro-optical/infrared cameras due to nitrogen leaks, and faulty synthetic aperture radars.

Operational Limitations: The CH-4B's performance has been questioned due to:

- Limited payload capacity.
- Shorter endurance compared to other MALE (Medium Altitude Long Endurance) UAVs.
- Susceptibility to electronic warfare and jamming.

These limitations have affected the drones' effectiveness in surveillance and combat missions.

Impact on Pakistan's UAV Strategy: Due to the aforementioned issues, the Pakistan Army has considered diversifying its UAV inventory:

- Exploring options from Western manufacturers, such as Austria-based Schiebel's S-100 UAV.
- Evaluating the integration of Turkish UAVs, like the Bayraktar TB2, into their fleet.

These steps aim to enhance the reliability and effectiveness of Pakistan's unmanned aerial capabilities. In conclusion, while the CH-4B UAVs have provided Pakistan with advanced surveillance and combat capabilities, their operational challenges have prompted a reassessment of their role within the country's defence strategy.

HJ-16 Anti-Tank Guided Missiles (ATGMs)

Pakistan Army tested the HJ-16 ATGM at Tilla range, but we found that it suffered repeated trial failures due to a high failure rate (low probability of kill). This led to the Chinese PLA near the LAC replacing HJ-16 with older SACLOS ATGMs, reflecting broader distrust in the system.

Figure 18 Representational image of Pakistan Army using ATGMs

The pattern of defective/low performing Chinese equipment in Pakistan's arsenal reveals a troubling trade-off: while China's lack of export restrictions makes it an attractive supplier, the recurring quality issues-ranging from non-functional frigate systems to grounded fighter jets and unreliable drones-have undermined operational readiness.

Bangladesh

Bangladesh has become one of China's most significant defence partners in South Asia, with Beijing dominating Dhaka's arms imports over the past two decades. Between 2019 and 2023, roughly 72 % of Bangladesh's military equipment was sourced from China, making it the second-largest buyer of Chinese weapons globally and accounting for about 11 % of China's total arms exports in that period.

Under its Forces Goal 2030 modernisation programme, Dhaka has acquired a wide range of Chinese platforms, from Ming-class submarines and Type 056 corvettes to MBT-2000 and VT-5 tanks, anti-ship and surface-to-air missiles, and short-range F-7 interceptor jets with Beijing also supporting domestic defence production and technology transfer. The two countries are now negotiating a US $2.2 billion deal for 20 J-10CE multirole fighters, a move that would be the largest aviation purchase in Bangladesh's history and further deepen military ties with China.

F-7BG and F-7BGI Fighters

The Bangladesh Air Force (BAF) has operated F-7BG and upgraded F-7BGI fighters, derivatives of China's Chengdu J-7, since the early 2000s.

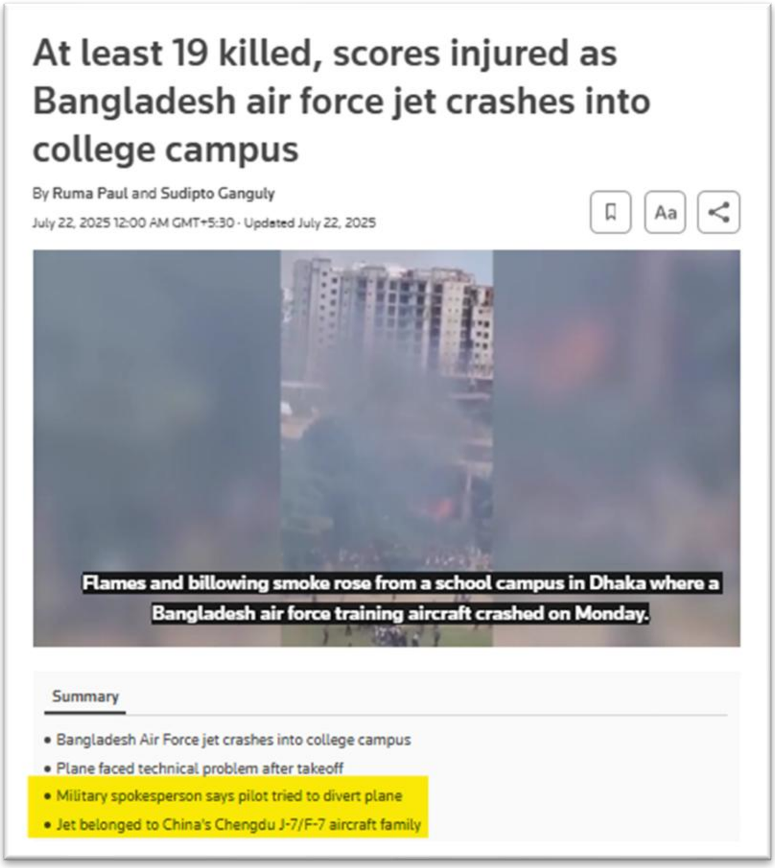
- Engine Reliability: The WP-13F engines required frequent overhauls after only a few hundred flight hours. Sudden power loss and unplanned ejections were reported.
- Avionics Shortcomings: The KLJ-6E radar and avionics suite in F-7BGI lacked robust multi-target tracking and were susceptible to jamming, limiting dogfight performance.
- Impact: Persistent safety and performance concerns have prompted calls for fleet replacement.

Crash Record in Bangladesh:

Over the years, the Bangladesh has experienced multiple incidents involving F-7 variants. Following is the list (non-exhaustive) of the same:

Crash Date	Type	Operator	Location	Summary
8 Apr 2008	F-7 (trainer variant)	Bangladesh Air Force	Paharipara village, Ghatail, Tangail District	An F-7 training jet crashed, the pilot ejected but later died from injuries.
29 Jun 2015	F-7MB	Bangladesh Air Force	Bay of Bengal, near Chattogram	An F-7MB disappeared from contact and crashed into the sea; the pilot was missing and presumed lost.
Nov 2018	F-7BG	Bangladesh Air Force	Madhupur, Tangail District	An F-7BG crashed during a training session; the pilot was killed.
21 Jul 2025	F-7BGI	Bangladesh Air Force	Milestone School & College campus, Uttara, Dhaka	A training F-7BGI crashed shortly after takeoff during a routine flight, striking a school, killing dozens including the pilot and many civilians and injuring many more.

Table 4 Crash Record of F-7 Variants in Bangladesh: Details of fatal and non-fatal training accidents involving BAF F-7 aircraft



At least 19 killed, scores injured as Bangladesh air force jet crashes into college campus

By Ruma Paul and Sudipto Ganguly

July 22, 2025 12:00 AM GMT+5:30 · Updated July 22, 2025

Flames and billowing smoke rose from a school campus in Dhaka where a Bangladesh air force training aircraft crashed on Monday.

Summary

- Bangladesh Air Force jet crashes into college campus
- Plane faced technical problem after takeoff
- Military spokesperson says pilot tried to divert plane
- Jet belonged to China's Chengdu J-7/F-7 aircraft family

Figure 19 Crash of F7 BGI Reported (Source: Reuters)

MBT-2000 Main Battle Tanks

Bangladesh Army procured MBT-2000 tanks (export variant of China's VT-1A) from NORINCO (Chinese state-owned defence corporation that manufactures commercial and military products) beginning in 2011–12 as part of its armoured modernisation under *Forces Goal 2030*, with 44 tanks delivered to date.

Bangladesh dissatisfied with China's military supplies quality: Reports

For a long time, China has been trying to emerge as the key defence exporter of the neighbouring countries of India. It uses the instrument of arms supply as "instrumentum regni" in Asia, that is, it tries to bind some countries with military dependence. However, the very low quality of the equipment produced, below Western standards, would seem to undermine this project, a media report said.

Figure 20 Bangladesh dissatisfied with Faulty Chinese Weapons Reported (Source: devdiscourse)

• **Fire Control and Systems Glitches**: Internal reviews and defence reporting indicate that *fire-control and sensor subsystems* on Chinese armour have shown calibration inconsistencies under field conditions, contributing to challenges in reliable target acquisition and accurate first-shot engagements in some exercises and operations, consistent with broader concerns raised about Chinese defence exports

• **Engine and Thermal Stress**: Although specific technical data on the MBT-2000's powerpack in Bangladesh is limited, third-party reporting on Chinese military exports highlights that reliance on externally sourced engines and difficulty securing quality spares has been a major stress factor for large vehicles in hot and humid operational environments. NORINCO has faced difficulties supplying parts for tanks and other platforms, raising sustainment concerns.

• **Spare Parts and Sustainment**: Bangladesh has formally reported that NORINCO has struggled to provide timely spare parts and maintenance support for MBT-2000 tanks, complicating repairs and increasing ground time for units, a concern that extends across Chinese-supplied platforms.

• **Operational Impact**: These logistical and support issues have reduced operational readiness metrics for mechanised formations and placed greater strain on local maintenance units and alternate technical support channels. The challenges reflect wider sustainment pressures faced by the Bangladesh Armed Forces due to concentration of Chinese hardware in the inventory.(The Asia Live)

Bangladesh military complains about faulty Chinese parts

By Dipanjan Roy Chaudhury, ET Bureau · Last Updated: Jun 13, 2024, 07:29:00 AM IST

Synopsis
Bangladesh, a major buyer of weapons from China, has accused Chinese companies of supplying faulty parts and technical problems with its imported military hardware. The Bangladesh military has accused Chinese companies of supplying faulty spare parts for corvettes, petrol crafts, and onshore patrol vehicles, with manufacturing defects and technical challenges. The Bangladesh Air Force has alleged technical problems with Chinese-made F-7 fighter jets and short-range air defense systems, and has faced issues with firing ammunition for its Chinese-made K-8W aircraft.

Bangladesh Air Force F-7 BGI

New Delhi: Bangladesh, a major buyer of weapons from China for decades, has complained to Beijing of supplying faulty parts as well as technical problems with its imported military hardware.

The Bangladesh military has recently accused Chinese companies of supplying faulty spare parts for its corvettes, petrol crafts and onshore patrol vehicles, people familiar with the matter told ET. These vessels were detected with manufacturing defects and technical challenges, the people said.

Separately, the Bangladesh Air Force has alleged technical problems with Chinese-made F-7 fighter jets and short-range air defence systems. The air force also faced issues with firing ammunition for its Chinese-made K-8W aircraft shortly after delivery, said the people cited above.

Figure 21 Bangladesh Military Complains about Faulty Chinese Weapons Reported (Source: Economic Times)

• **Recurring After-Sales and Maintenance Themes**: Across multiple Chinese-supplied systems, including armoured vehicles, aircraft, naval vessels and missile equipment, Bangladesh's armed forces have raised concerns over defective components, deficient spare-parts pipelines, and inadequate after-sales maintenance support. Sources note that NORINCO and other Chinese defence firms have been slow to deliver parts or upgrades, leading to extended downtimes and heavier reliance on local retrofits or third-party supply, which in turn impacts lifecycle costs and readiness.

Short-Range Air Defence Systems (SHORAD)

Bangladesh has strengthened its short-range air defence (SHORAD) capabilities to counter low-altitude threats, fielding a mix of systems including Chinese-supplied platforms and Western-origin man-portable systems. Key elements of this layered defence architecture include the FM-90 surface-to-air missile system, the mobile HQ-17AE SHORAD system, Chinese-licensed CS/AA3 (PG99) 35 mm anti-aircraft guns, and the Swedish RBS 70 NG portable air-defence system.

Our investigation found that while the concept of a layered SHORAD network enhances Bangladesh's ability to defend against drones, helicopters, and low-flying aircraft, several Chinese-made systems in this category have been flagged for technical and performance issues in broader military reporting. According to our sources, the FM-90 (a variant of China's HQ-7A) has exhibited multiple defects early in its service life, prompting plans to procure additional spares and support items to sustain operational readiness — an indicator of shortcomings in reliability and initial quality.


FEATURED

Bangladesh Faces Serious Problems With Chinese Supplied Military Hardware

Figure 22 Bangladesh Army Facing Issues Reported (Source: NewYork Globe)

Further, Bangladesh's military has formally complained to Beijing about technical problems with Chinese-manufactured short-range air defence systems, including reports that the systems have not consistently met expected performance or reliability standards during exercises and operations. These complaints formed part of a wider set of grievances covering Chinese hardware across several branches of the armed forces.

By contrast, no widely cited reports in open sources explicitly identify similar defects with the newer HQ-17AE systems, which are more recent acquisitions and still being integrated into Bangladesh's air defence architecture. This suggests that some modern Chinese systems may not yet have a long enough operational history in Bangladesh to reveal comparable issues. However, broader concerns about after-sales support, spare-parts availability, and technical documentation have been reported across China-supplied defence equipment, potentially affecting long-term sustainment and effectiveness of SHORAD deployments.

In summary, while Bangladesh's SHORAD network includes capable systems like FM-90, HQ-17AE, CS/AA3 and RBS 70 NG, our investigation confirmed that the older Chinese FM-90 and associated support infrastructure have experienced reported reliability and defect issues, and broader sustainment challenges are part of a pattern noted in multiple Chinese defence exports to Dhaka.

K-8W Trainer Aircraft

After Bangladesh Air Force (BAF) initially procured nine K-8W jets in 2014–15 and a follow-on batch of seven in 2020, multiple aircraft developed problems almost immediately following delivery, with at least two showing early faults that impacted basic operation. These issues were significant enough to raise concern within BAF and prompt repeated requests for technical assistance.

Figure 23 The K-8W Trainer Aircraft

- **Ammunition firing difficulties**: BAF reported that munitions loaded on K-8W aircraft did not fire reliably, a critical deficiency for a trainer capable of weapons training. This issue was flagged shortly after the aircraft were delivered, suggesting potential integration or system reliability problems.

- **Crashes and loss of aircraft**: At least one K-8W was lost in a fatal crash near Jassore in July 2018, indicating underlying reliability or training/operational risks in the fleet's early years.

- **Early mechanical instability**: In some reporting, K-8W aircraft were described as having radar and engine reliability problems and mechanical instability shortly after entering service, which contributed to temporary groundings of some units and the need to return affected aircraft to China for repair.

Chinese-Made Naval Ships

1. **Chinese Corvettes** - Manufacturing and Quality Defects: Bangladesh's naval corvettes and patrol craft supplied by Chinese builders have shown manufacturing defects and technical problems, as documented by defence sources. These issues were serious enough to prompt complaints from the Bangladesh military about faulty spare parts and overall reliability concerns in vessels delivered under Chinese defence contracts.

Figure 24 The Type 056 corvette (NATO reporting name: Jiangdao-class corvette)

Figure 25 In 2019, Bangladesh received two Shadhinota (Type C13B)-class corvettes it ordered from China in 2015

2. **Frigates** - BNS Omar Farooq & BNS Abu Ubaidah: Multiple defects were reported soon after the delivery of these two Chinese Type 053H3 frigates to the Bangladesh Navy in 2020. Reported issues include non-functioning navigation radar systems and gun systems, undermining key elements of the ships' combat and situational awareness capabilities. Rather than addressing defects under warranty, Chinese suppliers reportedly sought additional payments to carry out repairs, complicating sustainment and increasing costs for Dhaka.

Figure 26 Bangladesh Navy Frigate BNS Omar Farooq (F16) docked in Mongla Naval Base (BNS Mongla), Bangladesh

3. **Warship Weapon Systems -** C704 Anti-Ship Missile on BNS Nirmul: The C704 anti-ship missile system installed on the Bangladesh naval vessel *BNS Nirmul* developed persistent faults after delivery. When the Bangladesh Navy reported these shortcomings to the Chinese supplier, the company agreed only to upgrade the system in exchange for an extra payment, rather than fulfilling fixes under the original contract terms.

Figure 27 C704 Anti-Ship Missile

4. **Ming-Class Submarines -** Obsolescence and Limited Utility: Bangladesh purchased two refurbished Type 035G (Ming-class) submarines from China (commonly bought in the mid-2010s), but these boats were later found to be obsolete and less capable than expected. Repeated Dhaka requests for Chinese assistance in upgrading or maintaining these submarines reportedly went unanswered, leaving the Navy with platforms that had limited operational utility relative to contemporary threats.

Type 039G Submarines (BNS Nabajatra, BNS Joyjatra)

In 2017, Bangladesh Navy commissioned two refurbished Type 039G Ming-class submarines from China, marking a milestone in its underwater warfare capabilities.

- **Aging Platform:** Originally launched in the 1990s and decommissioned from the PLA Navy, these submarines were retrofitted before delivery.
- **Sonar and Navigation Limitations:** Defence news platforms including Naval News noted reliability issues in sonar detection and targeting accuracy, as well as low-grade inertial navigation systems.
- **Crew Safety Concerns:** Internal reports hinted at issues with air purification and acoustic noise levels, raising questions about crew endurance and stealth.
- **Impact:** Reduced submarine fleet reliability and effectiveness in actual combat situations, with increased maintenance cycles.

Iran

China's military relationship with Iran is far more opaque and strategically calculated than its overt defence partnerships with countries like Pakistan. While Beijing publicly maintains that it adheres to international non-proliferation norms and denies destabilizing arms transfers, a deeper investigation into historical records, Western intelligence assessments, and supply-chain data reveals a layered pattern of engagement.

Unlike the highly visible joint platforms seen elsewhere, China's support to Iran has evolved from direct weapons transfers in the 1980s–1990s to a more discreet model today—centered on missile systems, air defence platforms, and critical dual-use components that sustain Iran's indigenous military production. This shift allows Beijing to maintain plausible deniability while still playing a consequential role in strengthening Tehran's strategic deterrence capabilities.

Below is a structured breakdown of confirmed, reported, and historically documented Chinese-origin systems linked to Iran:

Weapon Name	Weapon Type	Remarks
HY-2 "Silkworm"	Anti-Ship Cruise Missile	Dozens (used during Iran–Iraq War)
C-801	Anti-Ship Missile	Significant quantities purchased and deployed
C-802 (derivative use)	Anti-Ship Missile	Locally produced variant in Iran
HQ-16	Medium-Range Air Defence System (SAM)	Limited deployments (operational)
HQ-17AE	Short-Range Air Defence System	Delivered (reported active use)
HQ-9 / HQ-9B	Long-Range Air Defence System	Deployed during USA-Israel war on Iran in March 2026.
CM-302 (YJ-12 export variant)	Supersonic Anti-Ship Missile	Deal reportedly nearing completion
Loitering Munitions (Chinese-origin UAV tech)	Drone / Kamikaze UAV	Technology transfer / adaptation
Missile Fuel Chemicals (Ammonium/Sodium Perchlorate)	Ballistic Missile Support	Enough for hundreds of missiles
Electronic Components (chips, sensors)	Dual-Use Military Tech	Embedded across drone & missile systems
Semiconductor Manufacturing Support	Military Industrial Tech	Enhances domestic weapons production
YLC-8B	Anti-Stealth Radar System	Deployed during USA-Israel war on Iran in March 2026.
SF-200	Loitering Munition / UAV	Deployed during USA-Israel war on Iran in March 2026.

Table 5 Chinese-Origin Systems Linked to Iran: A structured breakdown of missiles, air defence systems, and dual-use technology transferred to Tehran

During the February–March 2026 conflict involving Iran, United States, and Israel, battlefield evidence and defence analyses point to a systemic failure of key Chinese-origin or Chinese-linked defence systems that Tehran had long projected as pillars of its deterrence strategy.

At the center of this collapse was the HQ-9B surface-to-air missile (SAM) system advertised as a high-end, long-range air defence shield comparable to Western systems. Deployed around Tehran and critical nuclear facilities, the system failed to intercept any confirmed incoming aircraft or precision-guided strikes, allowing repeated penetrations of heavily defended airspace. The inability to counter stealth-enabled attacks raises serious concerns about target acquisition, tracking fidelity, and electronic warfare resilience.

Figure 28 Report by Investigative Journalism Reportika on the failure of the HQ-9B

Equally significant was the reported breakdown of the YLC-8B anti-stealth radar, a system specifically designed to detect low-observable platforms such as F-35-class aircraft. In practice, it failed to detect or provide actionable tracking data, with multiple units reportedly destroyed or neutralized in the opening phases of the strikes. This suggests a critical gap between advertised anti-stealth capability and real-world performance under combat pressure.

Iran's retaliatory posture also exposed weaknesses. The deployment of approximately 300 SF-200 loitering attack drones intended to overwhelm defensive systems resulted in near-total interception, primarily by layered missile defences such as Patriot systems. Only a single drone reportedly reached its target—and even then, failed to detonate, underscoring serious deficiencies in reliability, guidance, or payload effectiveness.

Beyond these headline systems, older Chinese-supplied drones and anti-aircraft platforms similarly failed to achieve a single confirmed shoot-down of attacking aircraft, indicating a broader collapse of integrated air defence effectiveness. Notably, there has also been no credible evidence of Chinese-origin offensive systems such as anti-ship missiles playing any decisive role in altering the battlefield dynamics.

The cumulative impact is stark: Iran's reliance on these systems resulted in repeated airspace breaches, degradation of strategic sites, and an inability to impose meaningful costs on attacking forces. For Tehran, the conflict has exposed not just tactical shortcomings, but a deeper structural issue the gap between imported or adapted military technology and its actual combat survivability against technologically superior adversaries.

Global Pattern of Underperformance of Chinese Weapons

A growing body of defence assessments and field reports indicates that Chinese-exported military systems—once marketed as cost-effective alternatives to Western hardware—are facing mounting credibility challenges across multiple countries. From Southeast Asia to Africa and Latin America, operators have reported technical malfunctions, combat inefficiencies, and reliability concerns, particularly under real battlefield conditions. Analysts note that these issues often stem from maintenance gaps, component quality, and limited combat testing, raising broader questions about the operational dependability of Chinese arms exports.

Country	Weapon System(s)	Reported Failure(s)	Key Sources
Venezuela	**HQ-9B SAM & JY-27A radar**	Failed to detect or engage any U.S. aircraft (including F-35s) during Jan 2026 Delta Force raid on Caracas; radars "blind" and systems non-responsive despite $2B+ investment.	Multiple U.S. and international defence reports (Jan–Mar 2026)
Thailand	**NORINCO VT-4 main battle tank**	125 mm gun barrel ruptured during live combat firing in 2025 Thailand-Cambodia border clash; crew injured, vehicle disabled without enemy action; Thai crews questioned overall reliability.	Royal Thai Army incidents & defence analyses (2025)
Myanmar	**JF-17 fighter jets (co-produced) & FTC-2000G jets**	Multiple JF-17s grounded for technical malfunctions; FTC-2000G repeatedly shot down in civil war operations due to poor performance.	Burmese military reports & independent monitoring (2022–2025)
Nigeria	**F-7 fighter jets & VT-4 tanks**	F-7 jets plagued by repeated technical failures; VT-4 tanks showed poor combat effectiveness against Boko Haram (mechanical breakdowns and vulnerability).	Nigerian military assessments & RAND analyses
Algeria	**CH-4 armed drones**	Multiple crashes attributed to landing/structural issues during operations; early procurement interest led to documented reliability problems.	Operator reports & drone incident databases
Iraq	**CH-4 armed drones**	Multiple crashes due to technical malfunctions during routine flights; high maintenance demands and losses in contested airspace (including to SAMs); low mission-capable rates historically.	2010s–2020s (e.g., anti-ISIS ops and later)
Jordan	**CH-4 armed drones**	Operational shortcomings led to decision to sell off units after ~3 years; issues included crashes, maintenance challenges, and overall dissatisfaction with reliability in service.	~2016–2019 (disposal of fleet)

Table 6 Global Pattern of Underperformance: A summary of reported failures for Chinese systems across various countries

Account of the Top Global Weapons Exporters

United States

The United States is the world's largest exporter of major weapons, accounting for about 43% of global arms exports in 2020–24, with a strong focus on advanced aircraft, missiles, and related systems. Its arms trade is dominated by large defence contractors such as Lockheed Martin, RTX (Raytheon), Boeing, Northrop Grumman, and General Dynamics, and key customers include allies in Europe and Asia–Pacific such as Ukraine, Japan, Australia, South Korea, and NATO partners.

The United States has strengthened its position as the world's leading arms exporter. Between 2015–2019 and 2020–2024, US arms exports grew by 21 per cent, with its share of global arms exports increasing from 35% to 43%. This volume of exports was nearly equal to the combined exports of the next eight largest suppliers. In total, the US supplied major arms to 107 states during this period.

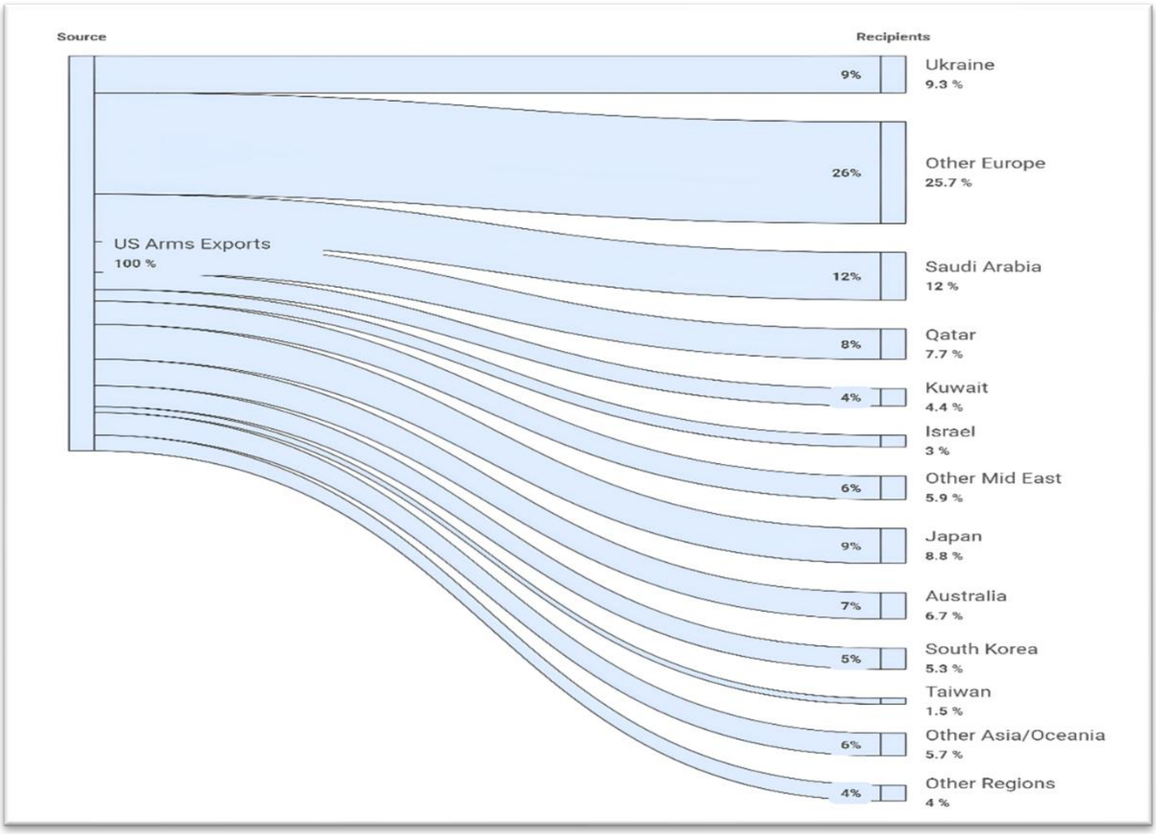


Figure 29 Distribution of USA's Arms Exports by Region and Key Recipient

Regional Distribution and Key Recipients

Europe: For the first time since 2000–2004, Europe became the largest destination for US arms exports, with the share rising from 13% to 35%. Exports to European states more than trebled (+233%), with Ukraine, the United Kingdom, the Netherlands, and Norway among the top ten recipients. Ukraine alone received 9.3% of all US arms exports, primarily as aid, with 71% consisting of second-hand arms for rapid deployment.

Middle East: The region received the second-largest share at 33%, a decline from 49% in 2015–2019. Key recipients included Saudi Arabia (12%), Qatar (7.7%), and Kuwait (4.4%). Israel ranked 11th with a 3.0% share.

Asia and Oceania: Countries in this region received 28% of US arms exports, largely driven by concerns over China's growing influence. Major recipients included Japan (8.8%), Australia (6.7%), and South Korea (5.3%). Taiwan received 1.5%, ranking 18th.

Major Arms Supplied

The US continues to supply advanced military systems globally, including combat aircraft, major warships, long-range missiles, and armoured vehicles. Highlights from 2020–2024 include:

Category	Units Supplied	Notable Notes
Combat Aircraft	996	Includes combat, trainer, and anti-submarine aircraft
Combat Helicopters	342	–
Major Warships	7	Includes aircraft carriers, corvettes, destroyers, frigates, submarines
Surface-to-Air Missile (SAM) Systems	41	Land-based systems only
Tanks & Fire-Support Vehicles	403	–
Other Armoured Vehicles	1,706+	–
Artillery	678+	–

Table 7 Major US Arms Supplied (2020–2024): Summarizes units supplied across categories like combat aircraft, missiles, and armored vehicles

The US also remains the primary supplier of long-range strike capabilities, providing 45% of global exports of land-attack missiles with ranges exceeding 250 km. Deliveries were made to seven states in 2020–2024, with pending shipments to 13 more.

Main defence manufacturers

Lockheed Martin is the largest arms-producing company globally, with nearly 65 billion USD in arms revenue in 2024; its portfolio includes F-16, F-22 (not exported), F-35 fighters, C-130 transports, and missile systems.

RTX (Raytheon), Northrop Grumman, and General Dynamics are also among the top US arms producers, covering missiles, radars, air-defence systems, combat vehicles, and naval platforms.

Boeing remains a major producer of combat aircraft and military transports, including F-15, F/A-18, and various support aircraft, many of which are exported.

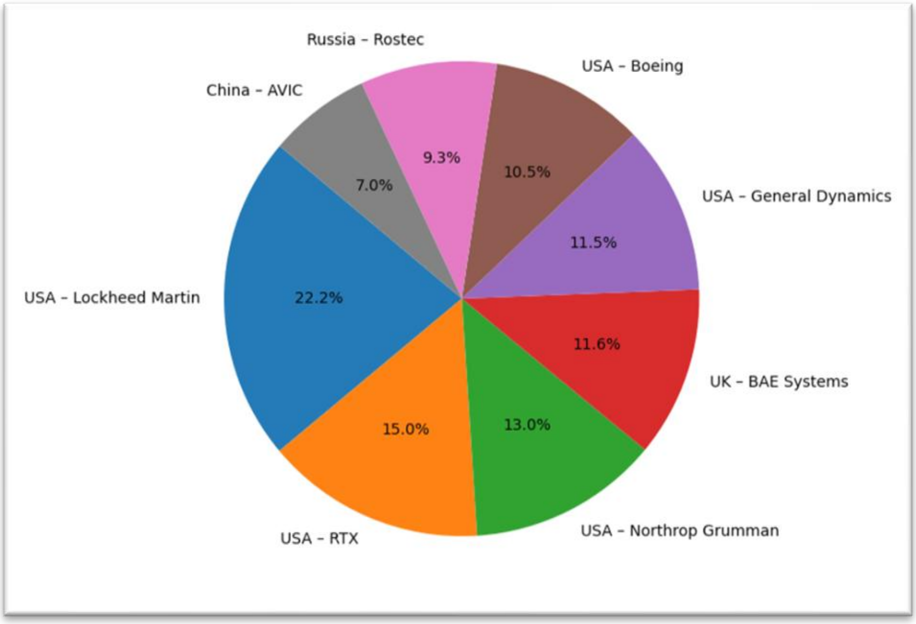


Figure 30 Share of Global Arms Sales by Top Companies (2024)

Best Performing U.S. Defence Exports

Among U.S. defense exports, several systems are widely regarded as the most combat-proven and operationally effective across multiple theaters. **The F-16 Fighting Falcon**, for example, has been extensively used by allied air forces in conflicts such as the **Gulf War, Iraq War**, and many **NATO air policing missions**, demonstrating high adaptability and multi-role performance.

The **F-35 Lightning II**, despite sustainment concerns, has been deployed in limited combat operations by **Israel in the Middle East** for precision strike missions, marking its first operational combat use. **U.S.-supplied Patriot air defense systems** have been actively used in **Ukraine's air defense against Russian missile** and **drone attacks**, where they have played a critical role in intercepting high-speed aerial threats.

Similarly, the **M1 Abrams main battle tank** has seen combat service in the **Iraq War**, where it demonstrated strong battlefield survivability against conventional armored threats.

Collectively, these systems highlight the operational strength of U.S. exports, particularly in terms of battlefield versatility, integration with allied forces, and sustained combat deployment across multiple modern conflicts.

Exported fighter jets and aircraft

Figure 31 Top fighter jets variants exports by the US

- US fighter jets currently in production and exported include the F-16 Fighting Falcon, F-15 (latest F-15EX variant), F/A-18 Super Hornet, and the F-35 Lightning II; the F-22 is not exported by law.

- The F-16 is one of the most widely exported US fighters, with more than half of active F-16s worldwide operated by foreign air forces; newer F-16V (Block 70/72) variants target export customers only.

- The F-35, the only exported US fifth-generation fighter, has been ordered or received by countries such as Australia, the United Kingdom, Italy, South Korea, Greece, Belgium, Canada, and others, with more than 1,000 aircraft delivered globally and over 600 in US service.

Reported Failures and Operational Concerns in U.S.-Exported Weapons Systems

Despite maintaining technological superiority and global dominance in arms exports, U.S.-origin weapons systems have faced documented reliability issues, operational constraints, and structural dependencies in several importing countries. These concerns are not universal, but where they exist, they have influenced procurement decisions, operational readiness, and strategic autonomy debates among U.S. allies.

1. Fighter Aircraft Reliability and Technical Failures

The F-35 Lightning II, the most widely exported fifth-generation fighter, has been central to both U.S. export success and recurring reliability concerns.

Several non-combat incidents and technical failures have been recorded:

- A U.S. Navy F-35C crash during routine operations and multiple earlier incidents involving engine fires, fuel system faults, and grounding orders point to systemic technical vulnerabilities.
- In Japan, an F-35A crash led to the grounding of the fleet during investigation, raising concerns over pilot-system interaction and situational awareness.
- A 2025 U.S. Air Force incident in Alaska showed how sensor and system misinterpretation (caused by ice contamination) rendered the aircraft uncontrollable, resulting in total loss.

Beyond crashes, operational reliability issues have also been highlighted:

- Persistent software instability, maintenance complexity, and spare-part shortages have reduced fleet readiness rates.
- The logistics ecosystem (including predictive maintenance systems) has faced criticism for inconsistent performance and availability.

These issues have had direct export implications:

- Countries such as Spain, Canada, and Switzerland have reconsidered or delayed procurement decisions, citing cost overruns, technical concerns, and operational dependency risks.

2. Maintenance Dependency and Operational Sovereignty Risks

A structural concern across U.S.-exported systems, especially advanced platforms like the F-35, is high dependence on U.S.-controlled logistics, software, and supply chains.

- Many systems require continuous access to U.S.-managed software updates, mission data, and spare parts pipelines.
- This creates limited operational autonomy for importing countries, particularly during crises where U.S. priorities may differ.

European defense analyses have identified:

- Delays in delivery timelines, with a majority of F-35 units delivered behind schedule in recent years.
- Risk of prioritization of U.S. forces over foreign operators in high-intensity conflict scenarios.
- Maintenance bottlenecks due to centralized supply chains and limited production capacity.

These factors have led to increasing calls in Europe for strategic autonomy in defense procurement.

3. Production Delays and Delivery Shortfalls

Export customers have faced significant delays in receiving key U.S. systems, affecting force planning and readiness:

- The F-35 program has experienced chronic delivery delays, with a sharp increase in late deliveries in recent years.
- The MIM-104 Patriot air defense system has also faced production constraints, with manufacturing capacity struggling to meet growing global demand.

For importing nations, these delays translate into:

- Capability gaps during critical periods
- Budgetary inefficiencies due to shifting timelines
- Increased reliance on interim or alternative systems

4. Integration and Interoperability Challenges

Operational incidents have also highlighted integration risks in multinational environments:

- A recent incident involving U.S.-origin F-15 aircraft being mistakenly targeted in a coalition environment underscore:
    - Complexity of identification systems
    - Challenges in joint operations under high-threat conditions
    - Potential vulnerabilities in communication and coordination systems

While not solely attributable to platform design, such events reflect the operational complexity of U.S.-supplied systems in diverse environments.

5. Strategic and Political Constraints on Usage

Another recurring concern is the policy framework governing U.S. weapons exports, particularly:

- Export controls under ITAR (International Traffic in Arms Regulations)
- Restrictions on technology transfer and system modification
- Limits on independent use without U.S. approval in certain scenarios

These constraints have:

- Delayed indigenous programs (e.g., technology transfer limitations affecting partner projects)
- Reinforced perceptions of "conditional sovereignty" in the use of U.S.-origin systems

Key Areas of Concern

Area	Nature of Concern	Impact on Importing Countries
Technical Reliability	Crashes, engine faults, software issues	Reduced trust, fleet grounding
Maintenance Dependency	Reliance on U.S. logistics and updates	Limited autonomy, readiness risks
Delivery Delays	Late production and supply shortages	Capability gaps
Operational Complexity	Integration issues in coalition warfare	Risk of misidentification, accidents
Policy Constraints	Export controls, tech restrictions	Strategic dependency

Table 8 Key Structural and Operational Concerns in U.S. Weapons Export Systems

While U.S. weapons systems remain among the most advanced globally, documented failures and systemic constraints particularly in high-end platforms like the F-35 highlight a pattern of complexity-driven vulnerability rather than outright unreliability.

The most consistent concern across importing countries is not simply technical malfunction, but a combination of:

- High maintenance burden
- Supply chain dependence
- Limited operational sovereignty

These factors are increasingly shaping procurement decisions, especially among advanced economies seeking greater control over their defense capabilities.

France

France was the second-largest exporter of major arms globally in 2020–2024, accounting for 9.6% of worldwide arms transfers. This represents an 11% increase compared to 2015–2019 and a 72% increase compared to 2010–2014. During this period, France supplied major arms to 65 states worldwide.

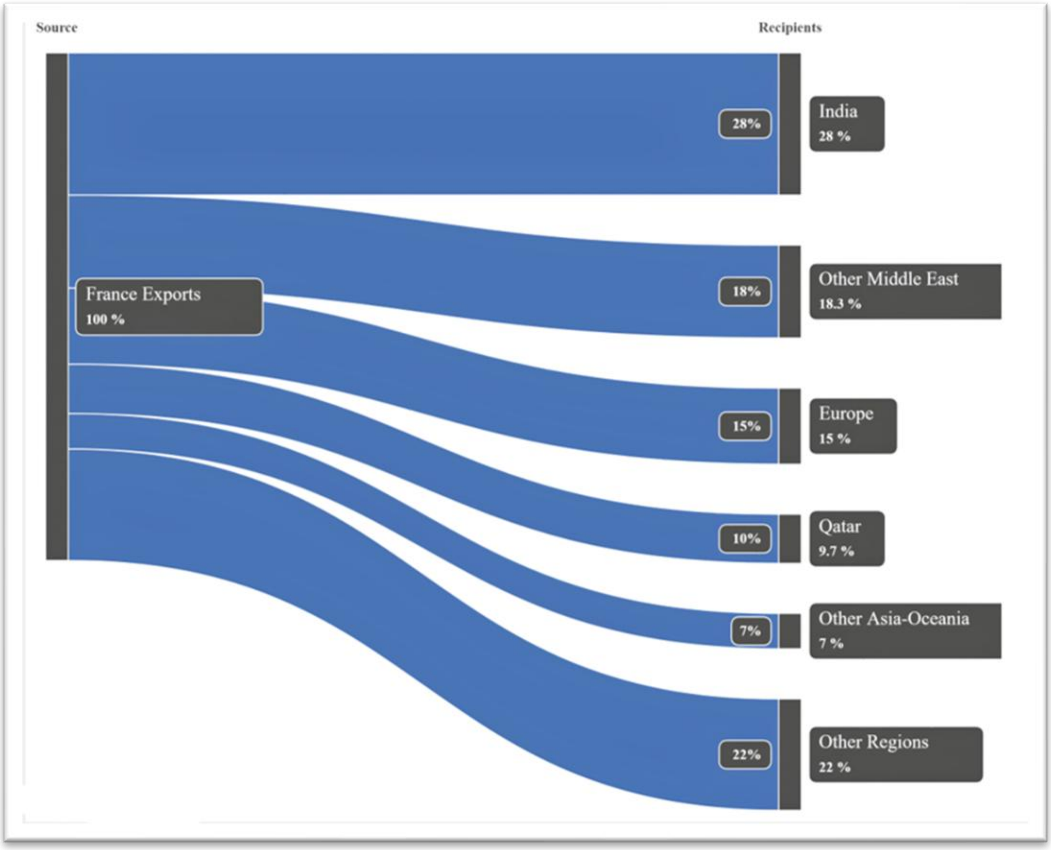


Figure 32 Distribution of France's Arms Exports by Region and Key Recipient

Regional Distribution and Key Recipients

Asia & Oceania: The largest regional share at 35%, driven largely by arms sales to India, which alone received 28% of total French arms exports.

Middle East: Accounted for 28% of France's exports, with Qatar being the second-largest recipient at 9.7%.

Europe: Represented 15% of French arms exports, with exports nearly trebling (+187%) compared to 2015–2019. Growth was primarily due to combat aircraft deliveries to Greece and Croatia and various arms—including artillery, missiles, and ships—to Ukraine after the Russian invasion in February 2022.

Major Arms Supplied

France exports a wide range of advanced military systems. Selected deliveries for 2020–2024 include:

Category	Units Supplied	Notes
Combat Aircraft	214	Includes combat, trainer, and anti-submarine aircraft
Combat Helicopters	3	–
Major Warships	22	Includes aircraft carriers, corvettes, destroyers, frigates, submarines
Surface-to-Air Missile (SAM) Systems	–	Land-based systems only
Tanks & Fire-Support Vehicles	–	–
Other Armoured Vehicles	537	–
Artillery	251	–

Table 9 Major French Arms Supplied (2020–2024): Details the volume of French defence exports, specifically highlighting combat aircraft and warships

France also has a significant number of pending deliveries for combat aircraft and major warships, indicating that it is expected to remain a top-tier global arms exporter beyond 2024.

Performance of French Defence Exports in Operational Use

French defence exports have demonstrated strong operational credibility across multiple conflict environments, with the **Dassault Rafale** emerging as one of the most combat-proven multi-role fighters in the global export market. The Rafale has been actively deployed by **India, Egypt, and Qatar** in varied operational settings, including high-altitude patrols, precision strike missions, and air policing roles. Notably, during heightened tensions between India and Pakistan, Rafale aircraft were deployed by India for long-range deterrence patrols and rapid response readiness missions. **Egyptian Rafales** have been used in **counter-terrorism operations in Libya**, while **Qatar** has deployed them for **regional air defense missions**.

French-origin systems such as the **Mirage 2000** have seen extensive combat use, including in **India's Kargil conflict operations**, where they were employed for precision bombing in high-altitude terrain.

These deployments collectively highlight that French defence exports are not only technologically advanced but also consistently validated in real-world combat environments with a strong record of operational reliability.

Reported Failures and Operational Concerns in French-Exported Weapons Systems

French defense exports—led by platforms such as the Dassault Aviation Rafale and Mirage series—are widely regarded as technologically capable and combat-proven. However, documented incidents, procurement challenges, and operational constraints in importing countries reveal specific, credible areas of concern, particularly around cost, technical incidents, and export competitiveness.

1. Documented Technical Failures and Crash Incidents

While French aircraft have a relatively strong safety record, isolated but notable technical failures have occurred in export environments:

- A Rafale operated by India reportedly experienced a high-altitude technical failure, highlighting vulnerabilities under extreme operational conditions.

- Export users such as Egypt have recorded aircraft losses, with replacement purchases indicating at least one non-combat attrition event within the fleet.

These incidents are not widespread but indicate that:

- Even advanced French systems face performance stress under diverse climatic and altitude conditions
- Export variants may encounter adaptation challenges in non-European environments

2. Cost and Affordability Constraints in Importing Countries

One of the most consistent and verifiable concerns with French weapons exports—especially the Rafale—is high acquisition and lifecycle cost:

- India's original large-scale fighter acquisition program was scaled down significantly due to cost concerns, reducing the planned number of aircraft.
- Multiple countries, including Morocco and South Korea, opted for alternatives such as U.S. fighters, citing cost-effectiveness and financing advantages over the Rafale.

Additionally:

- Belgium rejected the Rafale despite significant economic incentives, choosing a competing platform instead.
- Libya and other potential buyers did not proceed with deals, partly due to financial and procurement complexity.

This suggests that:

- French systems often struggle in price-sensitive markets
- High cost can indirectly affect fleet size, readiness, and operational sustainability

3. Limited Export Competitiveness and Failed Bids

Compared to U.S. systems, French weapons, particularly fighter jets, have historically faced difficulty securing export contracts, especially prior to 2015:

- The Rafale experienced a prolonged period without export buyers before its first major international sale.
- Several high-profile competitions were lost due to:
    - Higher cost relative to competitors
    - Perceived limited interoperability with NATO-standard systems
    - Financing and industrial partnership limitations

Even in successful deals:

- Countries often negotiate heavy offsets and support packages, indicating concerns over long-term cost and sustainment.

4. Maintenance, Support, and Scalability Challenges

French defense exports generally provide strong after-sales support, but concerns remain:

- Smaller production scale compared to U.S. manufacturers can lead to:
    - Slower supply chains for spare parts
    - Limited global maintenance infrastructure in some regions
- Countries operating smaller fleets (e.g., Egypt, Qatar) may face:
    - Higher per-unit maintenance costs
    - Dependence on French technical support for upgrades and servicing

However, unlike U.S. systems, French platforms are often viewed as less politically restrictive, which partially offsets these concerns.

5. Operational and Strategic Constraints

French systems are often described as highly capable but complex and expensive to operate, leading to:

- Reduced fleet sizes in importing countries
- Greater reliance on select elite squadrons rather than mass deployment
- Challenges in scaling operations during prolonged conflicts
- Some analysts have pointed to over-engineering and high-end configuration as factors limiting broader adoption in developing countries.

Key Areas of Concern

Area	Nature of Concern	Impact on Importing Countries
Technical Reliability (Limited Cases)	Isolated high-altitude/system failures	Localized operational risks
High Cost Structure	Expensive acquisition and lifecycle	Reduced fleet size, budget strain
Export Competitiveness	Lost bids to U.S. and other systems	Limited global footprint
Maintenance Ecosystem	Smaller global support network	Dependency on France
Operational Complexity	High-end systems, costly to scale	Limited mass deployment capability

Table 10 Key Structural and Operational Concerns in French Weapons Export Systems

French weapons systems, particularly those produced by Dassault Aviation, are technologically advanced and operationally credible, but the primary concerns identified across importing countries are economic and structural rather than systemic technical failure.

Unlike some competitors, France’s challenges are less about frequent malfunctions and more about:

- High cost and affordability constraints
- Limited scalability and export competitiveness
- Occasional technical incidents under extreme conditions

Russia

Russian arms exports traditionally focus on combat aircraft, air defence systems, tanks, artillery, combat helicopters, and missiles, particularly platforms designed during the Soviet and post-Soviet periods. The sector is dominated by state-owned conglomerates, primarily Rostec, which oversees major manufacturers such as United Aircraft Corporation (UAC), Almaz-Antey (air defence systems), Uralvagonzavod (tanks and armoured vehicles), Russian Helicopters, and Tactical Missiles Corporation (KTRV). These firms form the backbone of Russia's military–industrial complex and its export portfolio.

Global Share and Sharp Decline

Russia's arms exports fell by 64% between 2015–2019 and 2020–2024, marking the steepest decline among the world's major arms exporters. Despite this contraction, Russia still accounted for 7.8% of global arms exports in 2020–2024, placing it third globally after the United States and France.

Importantly, the downturn in Russian arms exports began before its full-scale invasion of Ukraine in February 2022. In 2020 and 2021, export volumes were already 22–73% lower than in any year between 2000 and 2019. This early decline was largely driven by a drop in orders from China and India, traditionally Russia's two largest customers.

Post-2022 Trends and Sanctions Impact

Following the invasion of Ukraine, Russian arms exports declined further. Export volumes in 2023–2024 remained around 47% lower than in 2022, reflecting several structural constraints:

- Prioritization of domestic military production to sustain Russia's own armed forces
- Multilateral sanctions limiting access to components, finance, and logistics
- Intensified pressure from the United States and allied states on potential buyers to avoid Russian arms

These factors have significantly reduced Russia's ability to compete in global arms markets, particularly for high-end systems.

Best Performing Russian Defence Exports in Operational Use

Among Russian defence exports, several systems have demonstrated notable operational effectiveness across multiple importing countries, particularly in air defence and legacy aircraft platforms. The **S-400 Triumf air defence system** is widely regarded as one of Russia's most successful exports, with deployments in countries such as **India, China, and Turkey**. In India, the system has been integrated into **layered air defence networks** and was reportedly operationally deployed during heightened tensions with Pakistan, enhancing long-range aerial surveillance and interception capability.

In **China**, the S-400 has been incorporated into **coastal and air defence architectures**, supporting strategic coverage against high-altitude and long-range aerial threats. Alongside this, the **Su-30MKI (India),** a heavily customised variant of the Su-30 platform, has remained one of the most reliable Russian-origin fighters in active export service, extensively used for air superiority missions and long-duration patrol operations.

Similarly, the **Su-35 (China)** has been deployed for advanced air defence and interception roles, reflecting strong performance in integration with Chinese command-and-control systems.

These systems collectively highlight that certain Russian platforms, particularly air defence systems and adapted fighter variants, have achieved sustained operational acceptance in foreign militaries due to their range, versatility, and adaptability in regional combat environments.

Regional Distribution and Key Recipients

Russia delivered major arms to 33 states during 2020–2024, a substantially smaller customer base compared with Western exporters.

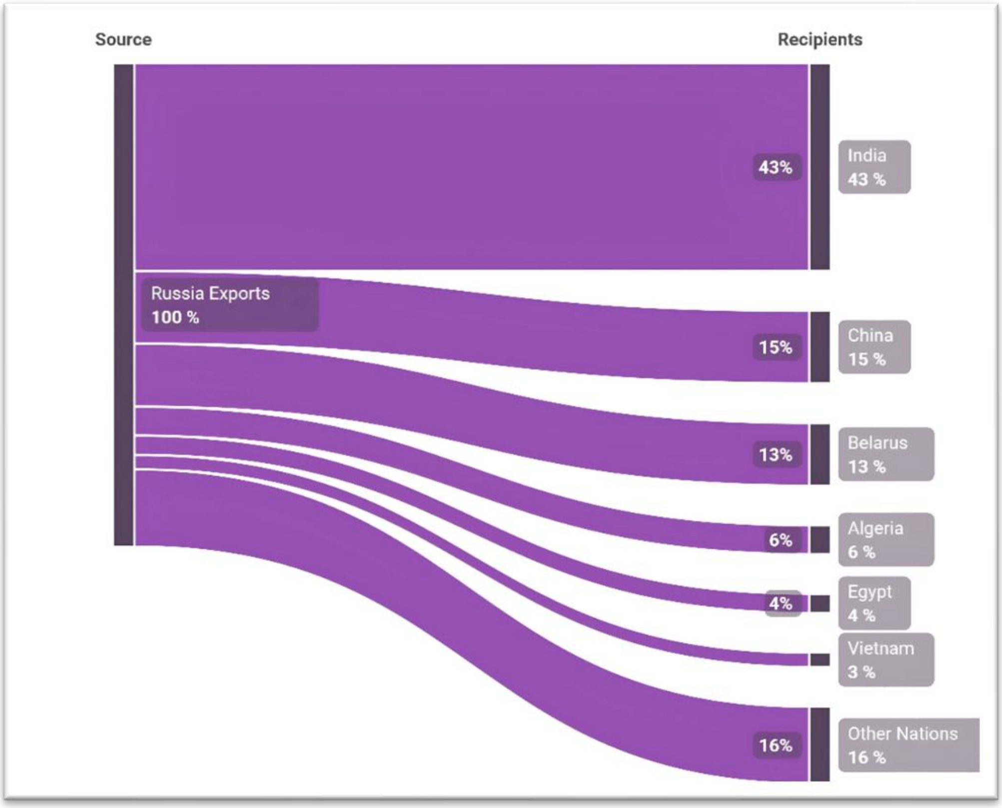


Figure 33 Distribution of Russia's Arms Exports by Region and Key Recipient

- Asia & Oceania – ~65–70%
- Dominated by India, China, Vietnam
- Europe (incl. Belarus) – ~10–15%
- Middle East – ~10–12%
- Includes Egypt, Iran (limited), Syria
- Africa – ~8–12%
- Algeria historically the largest
- Americas – <2% (negligible)

Exports were highly concentrated, with two-thirds of all Russian arms transfers going to just three countries:

- India – 38–48%
- China – 13–17%
- Belarus – ~13%

This concentration underscores Russia's increasing dependence on a narrow group of politically aligned or legacy clients.

Reported Failures and Operational Concerns in Russian-Exported Weapons Systems

Russian arms exports—long valued for their cost-effectiveness, ruggedness, and wide availability—have historically dominated markets in Asia, Africa, and the Middle East. However, credible operational data, accident records, and battlefield observations (particularly since 2022) indicate significant and recurring concerns related to reliability, maintenance, and technological limitations in several exported systems.

1. Technical Reliability Issues and Crash Incidents

Russian-origin aircraft and systems have been associated with multiple non-combat crashes and technical failures across export users:

- Though S-400s have performed exceptionally well in countries like India but it's MiG-21 and MiG-29 fleets have recorded numerous crash incidents over decades, often linked to aging airframes, engine issues, and maintenance challenges.
- Algeria and India have reported MiG-29 crashes, including incidents attributed to engine failure and mid-air technical faults.
- Transport aircraft such as the Antonov An-26 (widely used by Russian-aligned forces) have experienced fatal crashes linked to mechanical malfunction.

These patterns suggest:

- Persistent issues with legacy platform reliability
- Challenges in upgrading older Soviet-era designs to modern standards

2. Maintenance Burden and Lifecycle Constraints

A consistent concern among importers is the high maintenance burden and lower service life reliability of Russian systems:

- Countries operating Russian aircraft have reported:
    - Frequent overhaul requirements
    - Lower mean time between failures compared to Western counterparts
- India has repeatedly flagged spare parts shortages and inconsistent supply chains, affecting operational readiness of Sukhoi Su-30MKI and MiG fleets.
- Russian systems often rely on less automated diagnostics, increasing dependence on manual maintenance and skilled personnel

- Post-2022 sanctions have further strained global spare parts availability, worsening sustainment issues for export customers

3. Performance Gaps Observed in Conflict (Ukraine War Impact)

The war in Ukraine has provided unprecedented real-world data on Russian weapons performance, raising serious concerns:

- Advanced systems such as the Su-34 and Su-35 fighter aircraft have suffered notable attrition rates, including losses attributed to:
    - Air defense systems
    - Operational vulnerabilities (e.g., low-altitude flight exposure)

- Russian armored systems, including export variants, have shown:
  - Vulnerability to modern anti-tank guided missiles (ATGMs)
  - Structural weaknesses such as ammunition storage design flaws
- Missile systems have reportedly exhibited:
  - Accuracy issues in certain strikes
  - Reliability inconsistencies in guidance systems (as noted in multiple battlefield analyses)

While battlefield losses are not purely “failures,” they expose:

- Design limitations
- Gaps in survivability and modern warfare adaptability

4. Quality Control and Export Variant Concerns

Another recurring issue is the variation in quality between domestic and export versions:

- Some importing countries have raised concerns over:
  - Lower-spec export variants
  - Inconsistent manufacturing quality
- Historical examples include:
  - Algeria reportedly rejecting a batch of MiG-29 aircraft due to quality concerns

This suggests:

- Potential inconsistencies in production standards
- Export models sometimes lacking advanced avionics or protection systems

5. Declining Export Reliability and Supply Chain Disruptions

Since 2022, Russian arms exports have faced structural decline, affecting reliability perception:

- Domestic war requirements have:
  - Prioritized Russian military supply over exports
  - Delayed deliveries to international customers
- Sanctions have:
  - Restricted access to high-tech components (electronics, semiconductors)
  - Affected production quality and timelines

As a result:

- Countries such as Vietnam have begun diversifying away from Russian systems
- Long-term confidence in Russian supply chains has weakened

Key Areas of Concern

Area	Nature of Concern	Impact on Importing Countries
Technical Reliability	Frequent crashes in legacy aircraft	Safety risks, fleet grounding
Maintenance Burden	High overhaul frequency, spare shortages	Reduced readiness
Battlefield Performance	High attrition, vulnerability in Ukraine	Credibility concerns
Quality Control	Export variant inconsistencies	Reduced trust
Supply Chain Disruption	Sanctions and war-driven shortages	Delays, diversification

Table 11 Key Structural and Operational Concerns in Russian Weapons Export Systems

Russian weapons exports continue to appeal due to lower upfront costs and wide availability, but documented operational issues and recent battlefield performance have significantly impacted their perceived reliability.

The most credible concerns are not isolated incidents, but systemic patterns, including:

- Aging platform dependence
- Maintenance and logistics inefficiencies
- Performance limitations in modern high-intensity warfare
- Export quality inconsistencies

Underperformance Rate of Exported Systems

A comparative analysis of operational data reveals a stark divide in global arms reliability. China currently exhibits the highest proportion of reported failures, particularly within developing-world deployments in nations like Pakistan, Bangladesh, and Myanmar, where it faces an estimated underperformance rate as high as 30%–40%.

Meanwhile, Russia's military hardware reliability is visibly deteriorating due to the combined impact of sustained wartime pressure in Ukraine and multilateral sanctions that have restricted access to essential components and maintenance logistics. Still in select countries like India it has performed satisfactorily.

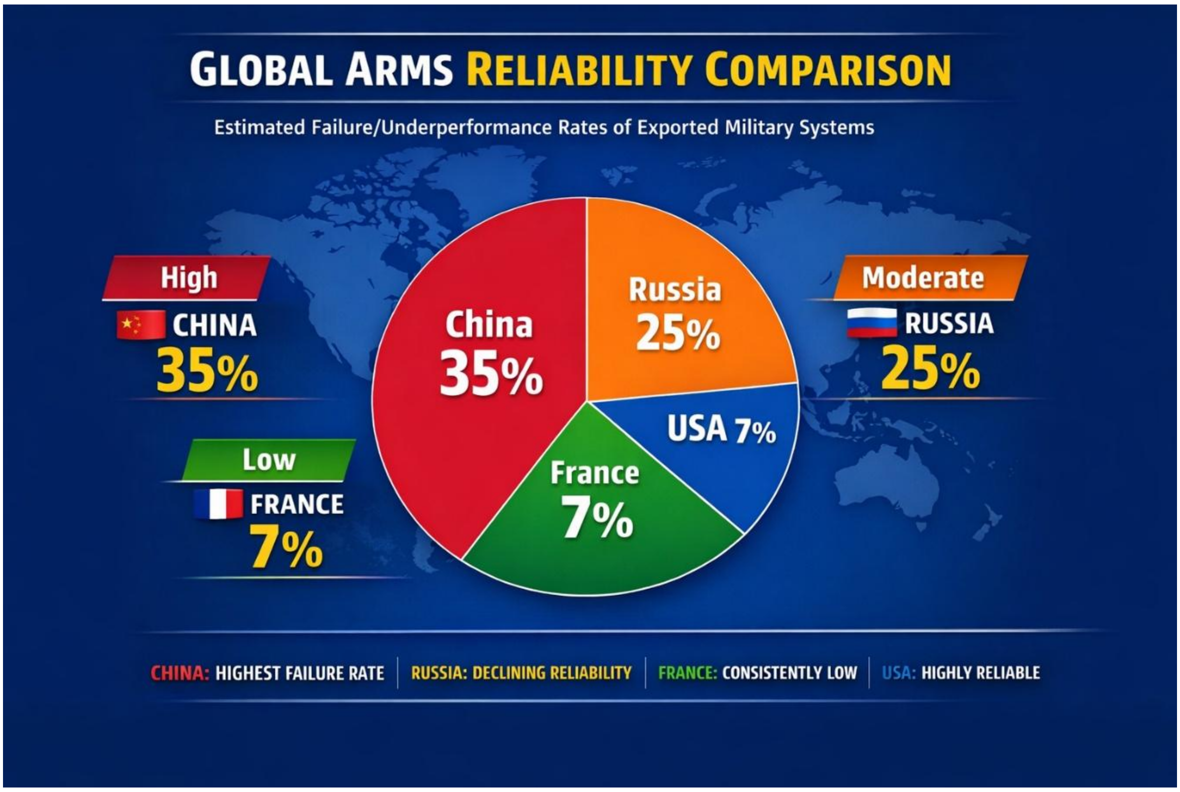


Figure 34 Estimated Failure / Underperformance Rate of Exported Systems

In contrast, Western systems from the United States and France maintain significantly lower failure rates (estimated between 5% and 10%), a success underpinned by extensive combat validation and the support of robust maintenance ecosystems that ensure long-term operational readiness.

Country	Estimated % of Systems Showing Failures / Underperformance	Evidence-Based Indicators
China	30% – 40% (High)	Repeated reports of malfunctions, crashes, grounded aircraft, and poor combat performance across multiple countries; declining export confidence due to quality and reliability issues
Russia	20% – 30% (Moderate–High)	Battlefield losses in Ukraine, declining exports, delivery failures, and sanctions impacting quality and maintenance
France	5% – 10% (Low)	Strong export growth, high-end systems (e.g., Rafale) with few widely reported systemic failures, increasing global demand
United States	5% – 8% (Low)	Dominates global arms market (42% share), high combat reliability, though occasional cost/maintenance concerns exist

Table 12 Estimated Failure / Underperformance Rate of Exported Systems: A comparative assessment of reliability rates between the US, France, Russia, and China

This assessment is based on a structured review of documented failures and operational incidents recorded between 2010 and 2026, cross-referenced with export volumes of major weapon systems. By compiling verified crash reports, technical malfunctions, and recurring performance issues across importing countries, and normalizing these against the total number of systems exported, a comparative underperformance rate was derived. This approach ensures that the estimates reflect not just absolute failure counts, but the relative reliability of each exporter's systems in real-world operational environments.

Conclusion

The data compiled in this report underscores a widening gap between the advertised capabilities of emerging arms exporters and their real-world performance. China, now the world's fourth-largest exporter, shows a failure and underperformance rate of 30%–40%, the highest among top-tier suppliers. This is not merely a matter of mechanical wear; it is a systemic crisis of quality control and accountability.

In Pakistan, the JF-17's legacy of engine malfunctions and the F-22P Frigates' non-functional missile systems have compromised national readiness. In Bangladesh, the reliance on Chinese hardware has resulted in "predatory" maintenance cycles where manufacturers demand extra payments to fix original manufacturing flaws. Most tellingly, the recent conflicts of 2025 and 2026 have exposed the total collapse of integrated air defence effectiveness when Chinese-origin systems like the HQ-9B and YLC-8B faced technologically superior, stealth-enabled adversaries.

The investigation concludes that while nations may pivot toward these platforms for political alignment or lower initial costs, they ultimately inherit a high maintenance burden and significant operational downtime. As demonstrated in Nigeria and Jordan, even cash-constrained air forces are beginning to weigh long-term sustainability over initial savings. In the modern theater of war, a weapon that fails in the field is not an asset it is a liability that carries a cost measured in both currency and lives.

References

- *Trends in International Arms Transfers, 2020–2024* – Stockholm International Peace Research Institute https://www.sipri.org/publications/2025/sipri-fact-sheets/trends-international-arms-transfers-2024
- *Ukraine becomes the world's biggest arms importer; US dominance of global arms exports grows* – Stockholm International Peace Research Institute https://www.sipri.org/media/press-release/2025/ukraine-worlds-biggest-arms-importer-united-states-dominance-global-arms-exports-grows-russian
- *SIPRI Top 100 Arms-Producing and Military Services Companies, 2024* – Stockholm International Peace Research Institute https://www.sipri.org/visualizations/2025/sipri-top-100-arms-producing-and-military-services-companies
- *The Military Balance 2025* – International Institute for Strategic Studies https://www.iiss.org/publications/the-military-balance
- *Russian Military Capabilities and Performance in Ukraine* – International Institute for Strategic Studies https://www.iiss.org
- *Russian MiG-29 Crash: More than Meets the Eye* – Royal United Services Institute https://www.rusi.org/explore-our-research/publications/commentary/russian-mig-29-crash-more-meets-eye
- *Assessing Russian Military Performance in Ukraine* – Royal United Services Institute https://www.rusi.org
- *F-35 Joint Strike Fighter: DOD Needs to Complete Developmental Testing Before Making Significant New Investments* – U.S. Government Accountability Office https://www.gao.gov/products/gao-23-105341
- *Weapon System Sustainment: Selected Air Force and Navy Aircraft Generally Have Not Met Availability Goals* – U.S. Government Accountability Office https://www.gao.gov/products/gao-22-104533
- *Defense Acquisitions Annual Assessment: Major Weapon Systems* – U.S. Government Accountability Office https://www.gao.gov/products/gao-24-106831
- *Flight Global Databases* https://www.flightglobal.com/airframers/1999/02/building-a-base/
- *The Irrawaddy News* https://www.irrawaddy.com/
- *The Defence Mirror* https://defensemirror.com/
- *Dawn News Pakistan* https://www.dawn.com/
- *The Eurasian Times* https://www.eurasiantimes.com/thunder-or-big-blunder-pakistans-cutting/#google_vignette
- *The Sunday Guardian* https://sundayguardianlive.com/news/engineered-for-failure-propulsion-woes-cripple-pakistan-navys-frigates-and-maritime-reach-134866/