Powerplay of Ballistic Missiles vs. Air-Defence in Operation 'True Promise 3'

Introduction

In response to Israel's 'Operation Rising Lion', Iran launched 'Operation True Promise 3' on 13 Jun 2025. A multitude of ballistic missiles was discharged directed at Israel, signifying the commencement of Iran's reaction to extensive Israeli assaults earlier. Iran's Revolutionary Guards Corps (IRGC) announced that it rendered a devastating, precise reply to Israel's aggression with promise of further waves of attacks.[1] As Iranian ballistic missile and drone incursions were detected, Israel deployed all operational air defence mechanisms including the Iron Dome system. Israeli defence mechanisms were said to have deployed numerous interceptors, whereas an Israeli representative affirmed that the United States (US) military was providing assistance in the interception of approaching Iranian missiles.[2]

Inspite of powerful Israeli air defence, like the Iron Dome, the waves of missile attacks launched from Iran was unprecedented and Israel suffered damages, mostly infrastructural, in the 12-day war. The air-threat pressure due to ballistic missiles was large and the only way to counter them in the present times was via the hard-kill mode, unlike the drones which can be tackled via the soft-kill approach also. Therefore, an analysis of Israel's air defence efficiency can provide us with vital information about how much pressure modern air defence can absorb before getting saturated in a very long duration of war.

Waves of missile attacks

Iran claims to have launched around 22 waves of ballistic missile attacks on Israel with some estimates suggesting at least 40 barrages and extensive damages to various locations.[3] As per sources in the 10th wave, Israeli airbases in Tel Aviv were targeted.[4] Local media outlets reported that with pinpoint missiles powered by solid and liquid fuel, the 18th wave was launched against Israeli military targets and operational support facilities in the heart of Palestine and Ben Gurion Airport which were successfully destroyed.[5]

Similarly, the 17th wave made impacts on a variety of targets, including the Nevatim and Hatzorim airbases, Haifa, and Beersheba, military installations, defence industries, command and control facilities, and businesses that assisted military activities.[6] The 20th wave of attacks used innovative strategies to get past Israeli air defences and had a combination of solid- and liquid-fuel rockets with high-explosive warheads. This strike hit Israel's biological research centers and reached the city of Ness Ziona, Ramat Gan and

Haifa's Carmel district.[7] Due to security concerns, the Israeli military had advised residents not to record the locations where missiles had struck.[8]

Strategic selection of targets

As per Iranian state media, Iran was successful in targeting various strategic targets associated with intelligence, military and defence industries in Israel and thus busted the global myth that Israel's air defence was invincible. The Kirya military-intelligence complex in central Tel Aviv also known as the 'Israeli Pentagon' and protected by a multilayered shield of Israeli and American defence systems and Aman military-intelligence centre at the Glilot Mizrah Interchange close to Herzliya which houses Mossad headquarters and equipped with GPS jammers were hit. The military targets including airbases like Tel Nof, Ben Gurion, Ramat David near Haifa, Palmachim on the Mediterranean coast, and Ovda near Eilat also got struck which hosts the F-15 and F-16 fighter squadrons.[9]

Energy infrastructures like Bazan Oil Refinery in Haifa, power stations in Ashdod and Orot Rabin also got damaged. In the military-industrial sectors, Rafael Advanced Defense Systems complex which produces missile interceptors for Iron Dome and David's sling, was hit. Additionally, affected was Kiryat Gat Industrial Zone, a significant hub for the manufacture of high-tech military equipment and microprocessors. Even Gav-Yam Negev Advanced Technologies Park near Beersheba, which houses companies engaged in military, artificial intelligence, and cyberwarfare technology, was not spared. Most significantly, important research facilities at the Weizmann Institute of Science in Rehovot, well-known for its military research and development and collaborations with Israeli military organisations, were severely damaged.[10]

Intensity and types of Iranian missiles

An Institute for the Study of War (ISW) report observed a total of 543 Iranian ballistic missiles accurately. It reported that 89 per cent of ballistic missiles were successfully intercepted by Israeli air defence systems which means that out of a total of 543 missiles, 483 missiles were intercepted successfully and around 11 per cent or 60 missiles were not intercepted. The report mentions Israel's air defence didn't stop these 60 ballistic missiles as they were headed towards targets that posed little threat to citizens or had no strategic significance. As per Israeli authorities, missile attacks in broad spaces are a sign of Israel's defensive priorities rather than a lack of interceptor missiles or a breakdown in air defence. This report also

mentions that Israel's pre-emptive assaults forced Iran to launch fewer ballistic missiles than its initial plan of launching 1,000 missiles.[11]

Israel's air force is also said to have destroyed about 120 missile launchers, or about one-third of Iran's pre-war launcher inventory. This roughly gives a figure of around a total of 360 ballistic missile launchers available with Iran, which got reduced to roughly 240 ballistic missile launchers. Western experts suggest that there is no evidence that Iranian missile strikes had improved in quality via their precision, accuracy or the Circular Error of Probability (CEP) after the 'Operation True Promise 1' in Oct 2024. Iran mainly fired Emad (1,700 kms range, Mach 7-8), Ghadr (1,350-1,950 kms range, Mach 9), Haj Qasem (1,400 kms range, Mach 12), Khaibar Shekan (1,450 kms range, Mach 12) and Fattah-1(1,400 kms range, Mach 13-15) systems during the Jun 2025 conflict. Further, it is being assessed that currently Iran still has roughly around 2,000 operational ballistic missile stockpiles with a production capacity of 50 missiles per month.[12]

Iranian media claim that 2 missiles played a key role in its operation against Israel. First Fattah-1, a solid fuel hypersonic missile having a CEP of 5m, was used to destroy radars of Israel's air defence which cleared the way for Ghadr and Emad missiles. Its warhead weight is between 450 and 500 kgs and it has an approximate range of 1,400 kms. It achieves 13 to 15 Mach during its last plunge phase, making intercepting it very challenging. Fattah-1 has a spherical solid-fuel propulsion system and a moving nozzle. Its manoeuvrable warhead—the Hypersonic Glide Vehicle (HGV) allows for intricate manoeuvres both inside and outside of the atmosphere.[13]

Secondly, for the first time, IRGC fired the long-range two-stage solid-fuelled Sejjil ballistic missile with an approximate range of 2,000 to 2,500 kms and a 500-1,000 kgs warhead. It attains speeds between 10 to 12 Mach and is claimed to include a cutting-edge inertial guiding system that provides an accuracy of less than 10m.[14] According to a number of accounts, North Korea provided substantial support in the development of Sejjil, which at least for its early production variants relied heavily on North Korean components. The IRGC is currently developing an intermediate-range ballistic missile based on Sejjil design that would enable it to hit America and their ally military positions throughout Europe. The missile would have an expanded range of 4,000 kms.[15]

Israeli missile defence limitations

Although Israel has been successfully defending its skies over the years from attacks by Iranian proxies like Hamas, Hezbollah and Houthis, those attacks were rather small in

number, intensity, were occasional and were mostly classified as rockets instead of proper missiles with no range or accuracy. But experts always believed that facing a large barrage of Iranian attacks would be a different scenario as Israeli defences would have been strained trying to repel such massive attacks. There are only a certain number of launchers available with Israel for the interceptor missiles. It would have put strain on the command-and-control system and radar resources to filter through all the incoming missiles, determine where they are going, and to assign which particular interceptor will hit which missile.[16]

The pressure for Israel was evident from the fact that they used interceptors more quickly than they could produce them as missile attacks continued. Experts were concerned and of the view that Israel's missile interceptors could run out of stock.[17] The US was also concerned due to Israel's cutting-edge missile interceptor's quick depletion. The US-Israel-developed Arrow air defence system, which is intended to intercept long-range ballistic missiles, is costly to replenish and maintain.[18]According to Israeli sources, Israel's missile defence was breached by at least 18 Iranian missiles out of a total of 30 during the 20th wave of attacks.[19]

Missile defences have inherent operational complexities as systems used to intercept drones or short-range rockets must be different from those used to intercept cruise missiles or mid-range ballistic missiles. As a result, it gets harder to oversee missile defence governance in case of a layered air defence configuration which Israel possesses.[20] In the past, a technical issue with the Arrow-3 interceptor was discovered by an Israel Defence Force (IDF) investigation. The nature of the problem, though, whether it be with sensors, guidance systems, or kill vehicles, was not made public. Despite successful testing and combat use against Iranian and Houthi missiles in 2023–2024, this raises the possibility of a reliability problem in real-world settings. A US-origin 'THAAD' interceptor was fired as a backup after Arrow-3's unsuccessful effort, but that also failed to intercept the missile.[21]

Lessons for India and conclusion

As India is a technological ally of Israel, the above dynamics of air defence during a longer intense conflict with missiles hold significant lessons in terms of missile defence. First, modern day battles will continue to be fought with projectiles and the use of missiles will always pose a threat which will increase in proportion to the number of missiles produced by the adversaries. Second, the accuracy and CEP of ballistic missiles hold no value when the enemy is ready to bombard the territorial area with an intense barrage for a longer time and has an intent to target non-military targets. Third, the degradation of enemy missile sites and

launchers is only possible in the absence of an air-force and thus Israel was able to degrade most launchers and missiles, but that can't be executed with nations having modern air-force and supporting air defence.

Fourthly, even with the layered air defence infrastructure, Israel had to rely on US support to shoot down Iranian missiles which again shows that one nation's air defence is not enough to sustain the air-pressure of a barrage of missiles during a 12-day war. Finally, and most importantly even though Israel and Iran are around 1,000 kms apart in distance, still Iran was able to exert pressure on Israeli missile defence. If suppose India's adversaries like China and Pakistan, which share borders with India decide to fire intense ballistic missile salvos during a longer duration war, especially with hypersonic systems, that could definitely test the limits of India's existing air defence capabilities. Hence, the Israel-Iran war should be wake up call to further strengthen and remove any operational gaps in India's existing layered air defence strategy.

Even though 'Operation Sindoor' was a success in terms of India's defence against Pakistan launched drones, we must also underline the fact that ballistic missile usage was lesser compared to the Iran-Israel scenario. Thus, Indian defence planners must not become complacent in the wake of success of 'Operation Sindoor' but must learn lessons from 'Operation True Promise 3' and continue to recognise the existing gaps of contemporary air defence dynamics.

Endnotes:

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