



WHAT FUTURE HOLDS FOR MIG-21 IN THE IAF?

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The Mikoyan-Gurevich (MiG)-21 was the dominant aircraft of its time. However, with 295 accidents and losses till date,¹ the most recent one being in Barmer (July 2022) and Hanumangarh (May 2023) districts in Rajasthan, it generated a debate throughout the nation. The aircraft had been ageing, and its retention was certainly blamed for the tragedies. The Indian government has declared the retirement of all MiG-21 variants by 2025.² It would be useful to assess the crucial role MiG-21s have played in the service to the nation.

The MiG-21 was the first non-western fighter jet stocked in the Indian Air Force's (IAF) inventory, and the agreement to buy these jets was closed in August 1962.³ In the agreement, it was concluded that 12 MiG-21s would be bought by the IAF. The first squadron of MiG-21s was established in Chandigarh. Named the 28 Squadron 'First Supersonics' in 1963, this year marks the 60th raising anniversary.⁴ It saw action for the first time during the 1965 Indo-Pak war, when the IAF had to step into the war with their trial squadron, which consisted of just eight serviceable aircraft. Mostly deployed in combat air patrol duties, these jets saw limited usage of their ammunition and missiles.

In 1966, the Department of Defense Production announced that the manufacturing program of the MiG-21 jets should be conducted in India in four stages, starting with assembly from completely knock-down kits to full assembly of the aircraft. In order to start the program, there were approximately 54 MiG-21s bought from the USSR.⁵ They were reassembled in Nasik, Maharashtra, under Russian supervision, and a special division was created as the 'MiG division.' As progress entered the development stage, almost 205 MiG-21 FLs were made. It was in the initial period of 1967 that the first Indian-assembled MiG-21 FL was delivered to the IAF. The jet was also referred to as

‘Trishul,’ and was the best of its time for close combat operations.

The MiG-21 FL jets had certain limitations, such as the cannon pod, which occupied much space in the centre pylon, not leaving space for drop tanks. The avionics were getting old, and the engine and fuel capacity could also be enhanced for better performance. Since these aircraft generated a sense of hope for the IAF, their upgrade of the aircraft became a necessity. There were demands to address the problems of limited range and armament. After the successful installation of the cannon pods, the jets did not remain unarmed even after they ran out of missiles.

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The IAF received around 65 MiG-21 M in 1971, which contained much-modified parts like a built-in GSS-2300L cannon, RP-21 MA radar, and ASP-PFD computing gunsight.⁶ Another advanced variant of these jets that the IAF received was the MiG-21 Bis, which was essentially created as a multirole fighter, primarily for operational roles. The aircraft could perform both air defence and ground attack roles. The key improvements were the R-25 engine, better avionics, and blind-flying instrumentation. Lastly, the MiG-21 Bis was modified to Bison for beyond-visual-range (BVR) missiles, radar warning receivers, helmet-mounted sighting systems, electronic countermeasure systems, and better avionics. The older fixed windshield was replaced by the frameless windshield, and the side-opening canopy was replaced with the bubble canopy with semi-circle rear view mirrors, offering a much better view.⁷

The upgrade of such an aircraft was approved in 1996, and it was projected that the life extension of the aircraft should reach the period of 2017-2018. However, the aircraft is still in use today. In its long years of service, the aircraft has supported the fighter pilots in many missions and has barely disappointed the IAF. Therefore, the IAF had combinations of MiG-21 FLs, Ms, and Bis’ squadrons where the FL variant was primarily used for training roles and, on the other hand, the M and Bis variants were used for operational roles.

MiG-21s Contribution to the IAF

The MiG-21 has played a crucial role in wars around the world, from the Middle East to the Vietnam War. Its operational capabilities, combined with the skills of pilots, have always managed to surprise the military aviation industry. Several missions have been successfully conducted by the IAF with these aircraft over the past three-quarter of a century.

Indo-Pak War 1971

To celebrate the Golden Jubilee of the Liberation of Bangladesh, former President of India Ram Nath Kovind was invited to Dhaka as a 'Guest of Honour.' During his meeting with his counterpart, President Abdul Hamid of Bangladesh, President Kovind gifted a replica of the 1971-era Mig-21 aircraft. This gift was a gesture to reflect the spirit of the 1971 Bangladesh Liberation War. This replica was modelled on a jet that was used in the 1971 war. The office of the Indian President also revealed that an aircraft of the same model was installed at the Bangladesh National Museum.⁸

During this war, IAF MiG-21 fighter aircraft baffled the Pakistan Air Force (PAF) and did not let the enemy troops move forward. It was clear that Pakistan started the air strikes against the major forward bases, but the IAF could certainly dominate the skies over both fronts. The first round of the battle had gone to the gnats; however, the MiG-21s were able to showcase their strengths and superiority in counter-air, escort, and close-air support tasks during the Blitzkrieg action over Bangladesh. On the western border, the PAF deployed the F-104 Starfighter to counter the IAF onslaught, but the MiGs could clearly outfight and outclass it. The first aerial victory over the Gulf of Kutch on December 12, 1971, marked an important victory in the history of the IAF.⁹ On December 14, 1971, a devastating attack was carried out by the MiG-21 fighter jets on the Governor's house in Dhaka that hastened the liberation of Bangladesh.¹⁰

Kargil War

It was noticed that the IAF flew its first air support missions on May 26, 1991, operating from the fields of Awantipora, Adampur, and Srinagar. Ground attack aircraft like the Jaguars, MiG-23, MiG-27, and MiG-21, as well as helicopter gunships, were used to attack insurgent positions. The role of a MiG-21 was essential in the Kargil War since, apart from being used for air interceptions, it is also compatible with operating in restricted spaces. During Operation Safed Sagar, MiG-21 helped the IAF provide fighter cover; marking the first large-scale use of air power after the Indo-Pak War of 1971.¹¹

Balakot Air Strikes

The Balakot air strike was in retaliation for the 2019 Pulwama terrorist attack that killed 40 Central Reserve Police Force (CRPF) soldiers. The air operation was code-named 'Operation Bandar.' Following the air operation, India and Pakistan engaged in an aerial battle in which Wing Commander Abhinandan's MiG-21 Bison was shot down by the PAF over the Line of Control (LoC), a day after the Balakot strike. Before the pilot ejected from his ageing MiG-21 Bison, he successfully shot down a fourth-generation F-16 of the PAF. He landed in Pakistani territory and was captured by the Pakistani villagers, who handed him over to the Pakistani Army. The Indian government was able to use its diplomatic reach to secure the immediate release of Wing Commander Abhinandan.¹²

This air skirmish threw light on the superiority of the MiG-21. Being a third-generation aircraft, a MiG-21 Bison was successful in shooting down a fourth-generation F-16 jet, which is equipped with much better radars. It is noteworthy that the MiG-21 Bison is not the same as the Soviet-era MiG-21. After 2006, the MiG-21's air-to-air combat effectiveness was given a boost after it was fitted with short-range and medium-range anti-aircraft missiles to increase its munition capacities. The Beyond Visual Range (BVR) missile system was also incorporated. It was this BVR targeting system that helped bring down the F-16 fighter jet.

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Recent Incidents

On July 28, 2022, a MiG-21 Bison crashed in the Barmer district of Rajasthan, in which the pilots suffered fatal injuries.¹³ However, the reasons behind the crash remain unknown. Common causes like bird hits, human errors, and technical defects were brought up. In another incident, On May 8, 2023, a MiG-21 took off from the Suratgarh airbase for training purposes. When flying over the Hanumangarh district of Rajasthan, the fighter pilot noticed technical failures in the warning lights in the cockpit. He soon realized that he could not control the aircraft and decided to eject. Three civilians died in the crash.¹⁴

As aforementioned, in total, there have been 294 crashes and losses listed since 1963-2022, out of which 86 crashes happened since the year 2000.¹⁵ Since there were a high number of crashes involving this type of aircraft, the operational capabilities were questioned. However, the term does not really seem appropriate because, first, it lowers the confidence of a pilot to fly this aircraft. Second, it must be understood that since there are many aircraft present within the IAF, the probability of crashes will clearly be higher. Thirdly, since there had been no major induction of new aircraft, MiG-21s had been lugging the heavy responsibility of air defence of India. Lastly, the MiG-21 has always been a single-engine aircraft, and any major technical glitch can cause engine failure. Since it does not have a second engine to rely on, the jet becomes prone to crashes.

In accordance with the Long-Term Re-equipment Plan 1981, it was noted that the MiG-21 fleet would be approaching the end of its service life and would certainly require replacements.¹⁶ The MiG-21 aircraft still in service have doubled their operational period since the report came out. It is essential to understand that the aircraft is not at all to blame since it is a man-made machine and has been used even after its age of retirement.

Phasing out MiG-21s

The Indian government had started to phase out the different versions of MiG-21s in separate stages. The MiG-21 FL, which formed the backbone of the IAF, took off for its last sortie from Kalaikunda Airbase, West Bengal, in December 2013. It has formed the

bedrock for the IAF, rendering 50 years of service. It is essential to realize that everything has an expiration period. Upgradation of radars, gun packs, etc., helped the jets perform at par with jets of recent times, but they had no impact on the total technical life of the aircraft.

The Indian government has stated recently that the remaining squadrons of MiG-21 Bison fighter jets will be phased out by the year 2025, looking at the technology and generation gap.

India has been relying heavily on the MiG-21 to maintain its air superiority in its neighbourhood. There are currently 31 MiG-21 squadrons in the IAF, and each squadron consists of around 16-18 aircraft. Looking at the increasing influence of China's military expansion and Pakistan's immediate threat to India's national security, India needs around 42 squadrons of fighter aircraft to meet and counter the threat from both countries at the same time. Phasing out the aircraft before a replacement is ready might make national security vulnerable. The IAF plans to induct Light Combat Aircraft (LCA) Tejas as a replacement for the remaining squadrons of MiG-21 Bison.

The idea to replace the MiG-21 with the LCA Tejas is not new and was first conceived in 1983. Hindustan Aeronautics Limited (HAL) was contracted to manufacture Tejas. However, due to India's reliance on other countries for engines, HAL's deadlines were pushed. It was intended that the LCA Tejas would be an indigenous product. Since the production of the LCA was severely delayed, the IAF had fewer options but to stick with MiG-21s. It was decided by the Indian government that MiG-21 Bis shall be further enhanced and modified to the levels of MiG-21 Bison to maintain operational viability and the desired force level. Additionally, the deal to procure 114 foreign fighter jets, dubbed Medium Multi-Role Combat Aircraft (MMRCA 2.0), will perhaps attempt to fill the gaps. Perhaps indigenous production for India is the need of the hour and must be implemented soon.

Nevertheless, the MiG-21 aircraft has projected the image of a dedicated machine since its induction. Undoubtedly, the success of the MiG-21 aircraft has attained global recognition, and its upgrade over the period has reached its maximum levels. It is a watershed moment for the men in blue, as they will not be able to hear the deafening roars of this aircraft in the future.

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Notes:

- ¹ “IAF, IA and IN Aircraft Losses Database”, *Bharat Rakshak*, <https://www.bharat-rakshak.com/IAF/Database/Accidents/listing.php?qacid=50&qt=TY&B2=Submit>. Accessed on July 24, 2023.
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- ⁸ President of India, “President Ram Nath Kovind presented a replica of 1971-era MIG 21 aircraft to President Abdul Hamid of Bangladesh. An aircraft of the same model gifted by India to Bangladesh has been installed at Bangladesh National Museum.” Twitter, December 15, 2021. 09:11 <https://twitter.com/rashtrapatibhvn/status/1471143455191486464?lang=en>. Accessed on May 28, 2023.
- ⁹ “Our Journey,” Indian Air Force, <https://indianairforce.nic.in/history-timeline/>. Accessed on May 27, 2023.
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¹⁵ *Bharat Rakshak*, n. 1.

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