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Issue Brief

The Indian Air Force's Declining Squadron Strength - Options and Challenges

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S*ummary*

The IAF is not without options, all of which are currently at some stage of realization. What is lacking is a sense of urgency on the part of all the parties concerned. The IAF is faced with an understandable but nonetheless severe shortfall in its squadron strength by 2025-2027. The path to avoiding this situation is open to solution. It is up to the Government and IAF to take the necessary decisions in a timely manner and ensure that existing projects are taken to conclusion and that new procurement endeavours are dealt with in an expeditious manner.

At a meeting of the Parliamentary Consultative Committee on Defence on 27 October 2017, senior officers of the Indian Air Force, including Vice Chief of the Air Staff, Air Marshal S.B. Deo, were reportedly rebuked by Defence Minister Nirmala Sitharaman for “inappropriate responses” to the issue of declining squadron strength.¹ It has been reported that the Indian Air Force (IAF) rehashed long standing issues of depleting combat strength without offering any solutions. Besides being somewhat tiresome for the aforementioned Committee – having undoubtedly heard the same refrain for some time – the lack of solutions being offered is somewhat surprising considering that a number of steps are currently being taken to address declining force levels. What is perhaps more serious is that some of these steps are being pursued in a half-hearted manner, which is not attributable to lack of budgetary support.

The Current Situation

The Indian Air Force has an effective strength of 31 combat squadrons, although it has 34 combat squadrons in total. These include eleven squadrons of the Su-30MKI, three each of the MiG-29 and Mirage 2000 (currently undergoing an upgrade), six of the Jaguar (at the initial stage of an upgrade process) and six of the MiG-21Bison. In addition, two upgraded MiG-27 squadrons continue to serve alongside the equivalent of half a squadron with the Tactics and Air Combat Development Establishment (TACDE). It is believed that three squadrons continue to operate older MiG-21s and non-upgraded MiG-27s – one each of the MiG-21bis, MiG-21M and MiG-27 - but these will be phased out in the near future, possibly by the end of 2017 or in early 2018.

It is to be noted that the peak strength of the Indian Air Force was approximately 39.5 combat squadrons, with four MiG-23MF/-BN and six MiG-27ML squadrons forming the core of the strike assets and some seventeen MiG-21 FL/M/MF/bis squadrons forming the bulk of the air defence units. These were, at the time, complemented by the Jaguar, Mirage 2000 and MiG-29 squadrons, which added a high-technology cutting edge to an otherwise mediocre force. Since then, the MiG-21 and MiG-27 squadrons have been in decline and the MiG-23 phased out completely.

¹ “Defence minister pulls up IAF top brass over declining squadron strength,” *Deccan Herald News Service*, 29 October 2017, at <http://www.deccanherald.com/content/640050/defence-minister-pulls-up-iaf.html> (Accessed 1 November 2017).

Type	Sqn No.	No. of Sqns
MiG-29	28, 47, 223	3
Mirage 2000H	1,7, 9	3
MiG-21 Bison	3, 4, 21, 23, 32, 51	6
Sukhoi-30 MKI	2, 8, 15, 20, 24, 30, 31, 102, 106, 220, 221	11 + 3 to be formed
<i>HAL Tejas</i>	45	<i>1 – not yet operational</i>
MiG-21Bis	26	1
MiG-27 UPG	10, 29	2
MiG-27 ML	22	1
MiG-21 M/MF	37	1
Jaguar IS	5, 6, 14, 16, 27, 224	6

		34 + one not yet operational
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Source: *Author's Research and Bharat Rakshak Aircraft Fleet Strength*²

The Challenge

The IAF desires a strength of some 42 combat squadrons by the period 2027-32 in order to meet the contingencies of a two-front war.³ Assuming a current practical strength of 31 squadrons (the three remaining MiG-21M/bis and MiG-27 squadrons being discarded), there is an immediate requirement for 11 more to meet its desired force levels by 2027. To date, three more Su-30MKI and two Dassault Rafale squadrons are on order, with two squadrons of Tejas MK.1 fighters supplementing them. All this will add some seven squadrons to the IAF. However, six squadrons of MiG-21Bison and the two MiG-27UPG will be phased out by 2025.⁴ If no new aircraft are ordered, it is possible that the IAF would be left with 30 combat squadrons by 2025 – an overall deficiency of 12 squadrons when set against its desired strength. Further, one Jaguar squadron is due to be retired by 2027, which would mean an overall deficiency of 13 squadrons by 2027.⁵

Although making up this shortfall by the year 2027 poses significant challenges, the IAF is not without options. It had planned to acquire an additional five squadrons of Rafales and undoubtedly would still like to do so if permitted. To compensate for this shortfall and to cater for future replacements for aircraft such as the Jaguar and eventually the MiG-29 and Mirage 2000, India has two active plans to bolster force levels. One of these involves the procurement of new single and twin-engine fighters, with the latter taking priority. The other involves the procurement of four squadrons of the Tejas Mk. 1A variant.

² "Aircraft Fleet Strength," *Bharat Rakshak IAF Page*, at <http://www.bharat-rakshak.com/IAF/units/others/281-fleet.html> (Accessed 1 November 2017).

³ "IAF to reach full squadron strength by 2032: Air chief," *Indo-Asian News Service*, 5 October 2017, at http://economictimes.indiatimes.com/articleshow/60958636.cms?utm_source=contentofinterest&utm_medium=text&utm_campaign=cppst (Accessed 1 November 2017).

⁴ "India will continue to operate the MiG-21 fighters until 2025," *Itar-Tass*, 9 October 2013, at https://www.rbth.com/economics/2013/10/09/india_will_continue_to_operate_the_mig-21_fighters_until_2025_30019 (Accessed 1 November 2013).

⁵ Note 3.

Single and Twin-Engine Fighter Procurement Projects

On 3 January 2017, the then Minister of Defence, Manohar Parrikar, made a series of pronouncements on the intended “Make in India” Strategic Partnership fighter projects. Among the information he revealed was this nugget: the next project will be for the manufacture of a single-engine type, with a twin-engine production line to be considered in the future. The Minister also made it clear that technology transfer and price competitiveness will determine India’s choice.⁶

The former Defence Minister made it clear that two separate “Make in India” programmes will be considered – the first for a single-engine type and the second for a twin-engine type.⁷ It has been speculated that the F-16 and Gripen will be in competition for the former category, while the F/A-18 and the Rafale will compete in the latter category. Of note is the plan for the aircraft to be built or assembled as part of the “Make in India” initiative through strategic partnerships with the Indian private sector. Lockheed Martin has forged a partnership with Tata Advanced Systems Limited (TASL), SAAB with the Adani group, and Dassault with the Reliance group. But none of these Indian partners has significant experience in manufacturing aircraft or their avionics to date.

While India’s selection of new fighters will depend on the capabilities offered, technology transfer and cost-effectiveness, there is a certain equivalence of performance among the types under review. All are multi-role aircraft with good manoeuvrability and adequate capabilities in all aspects of air-to-air and air-to-ground combat. The choice, therefore, should be made on the basis of the “package” offered rather than on individual aircraft specifications since the aircraft on offer are very similar. Yet, despite the claims of the respective companies, establishing production lines and delivering aircraft will invariably take some time, making quick availability of aircraft unlikely. In this regard, for twin-engine aircraft, one must ask whether an additional procurement of Rafales would not meet the requirement without the bureaucratic obstacles of a fresh round of trials.

There is legitimate concern that the choice of a new single-engine fighter type could jeopardize India’s own Tejas project. This should not be an issue since the single-

⁶ “Another Line Of Single Engine Aircraft To Be Made In India: Defence Minister Manohar Parrikar,” *Indo-Asian News Service*, 3 January 2017, at <https://www.ndtv.com/india-news/another-line-of-single-engine-aircraft-to-be-made-in-india-defence-minister-manohar-parrikar-1644703> (Accessed 1 November 2017).

⁷ Vishwanath Patil, “Make In India Possibility For Both Single Engine And Twin Engine Fighter jets,” *Defence World*, 4 January 2017, at http://www.defenseworld.net/news/18113/Make_In_India_Possibility_For_Both_Single_Engine_And_Twin_Engine_Fighter_jets#.WfovEmiPLD4 (Accessed 1 November 2017).

engine type being sought is to replace the MiG-23-MF/-BN and MiG-27ML aircraft in service, while the Tejas has been earmarked to replace the MiG-21. Nonetheless, at a time when budgetary allocations have not been generous, there is legitimate concern that allocations for a new single-engine aircraft could have a deleterious impact on the Tejas project. However, it is submitted that of greater concern for the Tejas is the fact that the project is plagued by delays in production as well as in completion of final operational clearance (FOC) trials. This may not be any single agency's "fault", but rather an adverse consequence of shifting priorities and lack of focus.

The Tejas – Delays and Lack of Focus

On 1 July 2016, No. 45 Squadron inducted the first two Serial Production models of the Tejas Mk.1 Light Combat Aircraft. Nearly 18 months have elapsed since these first aircraft were inducted, and they have now been joined by three more. A sixth is scheduled to join shortly and a total of eleven aircraft are supposedly to be on strength by March 2018.⁸ Built to IOC (Initial Operational Clearance) standards, these aircraft are the first of the twenty destined for No. 45 squadron, while an additional 20 will be built to FOC standard.⁹ Steady but somewhat slow progress is being made towards achieving FOC. On 12 May 2017, the Tejas Mk.1 crossed a major milestone when aircraft LSP-4 successfully fired a fully-guided Derby Beyond Visual Range (BVR) air-to-air missile. While gun trials were scheduled to commence in August 2017, they have now been delayed to early 2018 owing to a shift in priorities by the IAF.¹⁰

Yet, despite assurances from Hindustan Aeronautics Limited (HAL), slow progress has been made in establishing adequate production facilities.¹¹ HAL has not yet been able to meet the target of eight aircraft per year, much less an enhanced production target of 16 aircraft per year. Despite establishing a second production line using the BAE Hawk production facility – which has completed the manufacture and delivery of the last BAE Hawks to the IAF – there has been a very slow rate of progress in

⁸ Chethan Kumar "Private companies to carry out 70% of production work for Light Combat Aircraft Tejas," *Times of India*, 31 October 2017, at <https://timesofindia.indiatimes.com/india/private-companies-to-carry-out-69-of-production-work-for-tejas/articleshow/61363473.cms/> (Accessed 1 November 2017).

⁹ Gautam Datt, "IAF to induct 120 home-grown Tejas jets instead of 40 planned earlier," *Mail Today*, 11 October 2015, at <http://indiatoday.intoday.in/story/iaf-to-induct-120-home-grown-tejas-jets-instead-of-40-planned-earlier/1/495723.html> (Accessed 1 November 2017).

¹⁰ Manjeet Singh Negi, "Tejas successfully test-fires derby air-to-air beyond visual range missile," *India Today*, 12 May 2017, at <http://indiatoday.intoday.in/story/tejas-successfully-test-fires-derby-air-to-air-beyond-visual-range-missile/1/952546.html> (Accessed 1 November 2017).

¹¹ Ajai Shukla, "HAL to build 8, then 12, Tejas fighters each year," *Business Standard*, 30 December 2013, at http://www.business-standard.com/article/economy-policy/hal-to-build-8-then-12-tejas-fighters-each-year-113123000010_1.html (Accessed 1 November 2017).

increasing the production rate of the Tejas.¹² Now, despite earlier promises of delivery in early 2017 of the sixth aircraft to the IAF, it is hoped that this aircraft may fly by 5 November, with the seventh following a week thereafter. These delays on the part of HAL have adversely impacted the establishment of No.45 squadron as a viable operational entity as it continues to operate with only five aircraft.

Even in its limited capability IOC configuration, the Tejas Mk.1 offers No. 45 Squadron considerable capability. Air defence and self-defence combat is catered for by the R-73 missile and the aircraft is cleared for the delivery of guided and unguided air-to-ground ordnance. An armament detachment, i.e., weapons firing, was successfully conducted by No. 45 squadron between September and October 2017, apparently with good results, which augurs well for the acceptance of the Tejas as a front-line aircraft.¹³

However, the full capability of the basic Tejas Mk.1 would not be realized until the FOC version is delivered. In this regard, while BVR tests have been successful, flutter testing aimed at exploring the BVR envelope is still ongoing. The aircraft has an internal twin-barrel Gsh-23 gun. It was expected that gun trials would have been completed by now. But, apparently, at the IAF's request, the Aeronautical Development Agency (ADA) has been asked to prioritize the closing of outstanding air-to ground ordnance delivery issues and mid-wing pylon drop-tank clearance along with in-flight refuelling. The priority given to the latter is somewhat surprising. These shifting priorities have upset timelines for the FOC and the induction of a second squadron of the type – with the upgrade of the first to be followed thereafter. Whether the IOC aircraft have BVR capability is debatable. However, they have the requisite radar, even if with a suboptimal radome, and the Derby BVR missile has been shown to be compatible.

On 8 November 2016, the Defence Acquisition Council (DAC) cleared the production of 83 Tejas Mk.1A aircraft at an estimated cost of USD 7.5 billion.¹⁴ The Tejas Mk.1A – for which a prototype previously designated Tejas Mk.1P was proposed by HAL – is designed to correct many of the existing shortcomings in the FOC aircraft.¹⁵ To this

¹² Ajay Banerjee, "Pvt firms to produce Tejas body, wings; HAL to play integrator," *The Tribune*, 20 March 2017, at <http://www.tribuneindia.com/news/nation/pvt-firms-to-produce-tejas-body-wings-hal-to-play-integrator/379448.html> (Accessed 1 November 2017).

¹³ Note 8.

¹⁴ Jay Menon, "Indian Air Force To Get 83 Tejas Mk. 1-A Light Combat Aircraft," *Aerospace Daily and Defence Report*, 8 November 2016, at <http://aviationweek.com/awindefence/indian-air-force-get-83-tejas-mk-1-light-combat-aircraft> (Accessed 1 November 2017).

¹⁵ Ajay Shukla, "Parrikar cuts Gordian knot to boost Tejas line" *Business Standard*, 2 October 2015, at http://www.business-standard.com/article/economy-policy/parrikar-cuts-gordian-knot-to-boost-tejas-line-115100200031_1.html (Accessed 1 November 2017).

end, the Tejas Mk.1A is intended to be equipped with an Active Electronically Scanned Array (AESA) radar and electronic warfare systems currently missing from the FOC Tejas Mk.1.¹⁶

However, DAC clearance is not the same as a contract – hardly surprising since the avionics fit still awaits a decision from HAL despite a tender being floated for AESA radars and jamming pods.¹⁷ On 5 October 2017, Air Chief Marshal Dhanoa spoke of shortly “issuing the “RfP for 83 more LCAs”, indicating a disconnect or at the very least poor communication between HAL and IAF.¹⁸

Despite HAL being the lead agency for the Tejas Mk.1A, it has not accorded the project sufficient priority despite it offering HAL the opportunity to be part of the design and development of an indigenous aircraft. The proposed Tejas Mk.2, with a new GE414 engine, is a promising development of the type. But, to date, work has been minimal. To be fair, it has been suggested that the reason for the failure to select the radar/ electronic warfare package for the Mk.1A may be due to the preferred supplier escalating costs to an unacceptable level.¹⁹

The Tejas, especially its Mk.1A variant, offers an opportunity for the IAF to close its squadron strength shortfall. Unlike the proposed single and twin-engine procurement projects, this is an endeavour that, despite delays, has borne some fruit and is at the cusp of making a viable, relatively low-cost, replacement for the MiG-21 available to the Indian Air Force. If HAL were to treat the Mk.1A as a priority and the IAF and ADA take the necessary steps to complete the FOC of the basic Mk.1 without further delays and shifting priorities, then there is a possibility of two Tejas Mk.1 and four Tejas Mk.1A squadrons being in service by 2025 – filling the gap left by the retirement of the six MiG-21Bison squadrons. If the Mk.2 is sanctioned and developed with alacrity, then the prospect for additional Tejas squadrons is in the offing – replacing aircraft such as the upgraded MiG-29 and even the upgraded Mirage 2000 by 2032.

¹⁶ Gulshan Luthra, “HAL developing LCA-1P with AESA Radar,” *India Strategic*, May 2015, at http://www.indiastrategic.in/topstories3767_HAL_developing_LCA-1P_with_AESA_Radar.htm (Accessed 1 November 2017).

¹⁷ Bilal Khan, “India Floating AESA Radar Bids for HAL Tejas Mk-1A,” *Quwa.org*, 19 December 2016, at <http://quwa.org/2016/12/19/india-floating-aesa-radar-bids-for-hal-tejas-mk-1a/> (Accessed 1 November 2017).

¹⁸ Note 3.

¹⁹ Discussions with aviation journalists and Tejas project personnel.

The IAF's options

Any procurement invariably meets the problem of the none-too-generous capital budget allocated to the IAF. It has been established that the IAF needs to induct no fewer than 12 combat squadrons to meet its targeted strength by 2027.

As a first step, it is suggested that full support for the Tejas Mk.1A project has to be forthcoming on the part of all stakeholders – Government, ADA, HAL and IAF. This would deliver four squadrons to the IAF by 2025, with the prospect of additional aircraft if the Tejas Mk.2 is funded and developed through the necessary redesign of the airframe. A lack of focus and priority has been the bane of the Tejas project in recent years rather than technical shortcomings in the aircraft or technological hurdles. HAL's somewhat lackadaisical approach to the production of Tejas Mk.1 has to end.

The second step that needs to be taken is to forego the selection of a new twin-engine fighter under a "Make in India" initiative. The selection of the Rafale should stand and, subject to the price and technology transfer package being satisfactory, the induction of additional Rafale aircraft beyond the existing 36 should be considered as a priority. A separate twin-engine project, unless there are severe problems with the Rafale, is a time-consuming luxury with little benefit to India.

Finally, the Government of India through the Ministry of Defence and the IAF needs to take steps towards initiating the procurement of a single-engine type through the Strategic Partnership route. Nearly a year has elapsed since the project was announced by the then Defence Minister without any tangible progress being made. The process has to be started and completed in a time-bound manner so that the IAF can reap the benefits of this programme.

The IAF is, therefore, not without options, all of which are currently at some stage of realization. What is lacking is a sense of urgency on the part of all the parties concerned. The IAF is faced with an understandable but nonetheless severe shortfall in its squadron strength by 2025-2027. The path to avoiding this situation is open to solution. It is up to the Government and IAF to take the necessary decisions in a timely manner and ensure that existing projects are taken to conclusion and that new procurement endeavours are dealt with in an expeditious manner.

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