



C-295 FLEET: A BOOST TO INDIAN AIR FORCE AIRLIFT CAPABILITY

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On September 13, 2023, the Indian Air Force (IAF) received its first C-295MW transport aircraft with an indigenous electronic warfare suite and rear ramp opening in an Airbus manufacturing assembly line at the San Pablo Sur site in Seville, Spain. In a high-profile event, the Chief of the Air Staff, Air Chief Marshal VR Chaudhari, received the keys to the first aircraft from Jean-Brice Dumont, the Head of Military Air Systems at Airbus. At the occasion, Dumont exclaimed, “It was only two years ago that we signed this contract with India, the largest order in the history of the C-295.”¹ A week later, on September 20, 2023, this aircraft, jointly flown by a joint IAF-Airbus crew, landed at its Indian home base, Vadodara. It was officially inducted into the IAF in a formal ceremony on September 25, 2023, at Air Force Station Hindan by Raksha Mantri Shri Rajnath Singh.

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The Defence Ministry awarded a contract worth over Rs 21,000 crore to Airbus Defence and Space to deliver 56 C-295MW military transport aircraft to the IAF on September 24, 2021. According to the agreement, Airbus Defence would jointly build the platforms with Tata Advanced Systems Ltd. (TASL). While 16 aircraft would be delivered in flyaway condition, 40 would be manufactured and assembled in India as part of an industrial partnership between the two companies. The second aircraft is due to be delivered in May 2024, and the next 14 will roll out at a rate of one per month until August 2025 from Seville, Spain. The C-295s will replace the IAF’s ageing fleet (nearly 50 years old) of Avro aircraft.²

The IAF is in the process of significantly enhancing its airlift capability with the acquisition of the C-295MW aircraft. The C-295MW (Military Winglet) variant is an upgraded version of the basic C-295 model. The 'MW' variant includes various improvements, such as enhanced performance in hot and high conditions, winglets for improved performance, and additional capabilities. These aircraft will enable efficient and seamless operations in varied terrains and extreme weather conditions.

The C-295 transport aircraft is classified as a modern twin-turboprop tactical airlifter that can perform short take-off and landing (STOL) operations on semi-prepared runways.

IAF Transport Aircraft Inventory

The IAF has a moderate holding of transport aircraft in its inventory. It includes all types of aircraft, including heavy and medium airlifters, which serve the purpose of effectively carrying out strategic and tactical operations. The current inventory of fixed-wing transport aircraft is summarised in Table 1.

Table 1: Inventory of Transport Aircraft of the IAF

Fixed Wing Transport Aircraft Category		
Name of Aircraft	In Service	On Order
IL-76	17	
C-17 Globemaster III	11	
C-130J	11	
An-32	56 (Being upgraded)	
C-295MW	1	55
HS-748 Avro	56 (To be phased out)	
Boeing 737	2+	
Do-228 Dornier	40+	
Embraer (VIP)	4	

Source: *Brahmand World Defence Update 2023*, (New Delhi: Pentagon Press LLP, 2023), pp148

Specifications of C-295MW

The C-295 transport aircraft is classified as a modern twin-turboprop tactical airlifter that can perform short take-off and landing (STOL) operations on semi-prepared runways. It is noteworthy for its substantial payload capacity of 9,250 kg and its service ceiling, which reaches around 7,620 metres (25,000ft). The aircraft's ability to utilise runways with lengths of only 320 metres (1,050ft) for landing and take-off, as well as 670 metres (2,200ft) for unprepared airstrips characterised by both soft and rough surfaces, facilitates its access to runways located in close proximity to battle areas, or in places where the transportation of supplies and personnel is required. The aircraft can engage in low-altitude flying to execute tactical operations, with the capacity to reach speeds as low as 110 knots.³

The aircraft has a fuel capacity of 7,700 litres, enabling it to achieve a maximum range of 5,630 km. The aircraft can fly up to a maximum endurance of 11 hours and carry 71 combatants, or 50 paratroopers, together with five pallets.⁴ This enables the aircraft to effectively carry out logistical operations in areas inaccessible to larger aircraft.

The C-295M aircraft can incorporate the INDRA ALR-300V2B radar warning receiver and the BAE Systems ANALE-47 chaff/flares dispenser as an integral component of countermeasures.

The aircraft can be modified with a supplementary probe for probe and drogue refuelling, hence enabling the extension of its range by in-flight refuelling. Airbus successfully implemented a removable air-to-air refuelling (AAR) kit to refuel a C-295 aircraft from the Spanish Air Force during flying tests. In January 2020, the system was subjected to proximity tests using the C-295 and the F-18 aircraft of the Spanish Air Force. The aircraft's initial contact with a wet surface was accomplished during aerial refuelling (AAR) tanker flight tests. It is not clear whether IAF aircraft will have this capability *ab initio*.

The C-295 aircraft, produced by Airbus, is available in various configurations. These include the C-295 Tactical Transport, the C-295 Maritime Patrol Aircraft (MPA), the C-295 Maritime Surveillance Aircraft (MSA), the C-295 Armed/ISR, the C-295 SIGINT, the C-295 AEW, the C-295 Air to Air Refuelling, the C-295 Medevac, and the C-295 Water bomber.⁵ Apart from a few fixed configurations, the C-295 aircraft can be adapted for various purposes, such as VIP transportation, medical evacuation, military operations, air-to-air refuelling, and civic and humanitarian missions. The aircraft fuselage can be modified for medical evacuation, accommodating up to 27 stretcher patients and four medical personnel. A potential alternative arrangement allows for a dedicated space for a 12-bed intensive care unit specifically designed to accommodate patients on stretchers.

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Global Presence of C-295 Aircraft

The C-295MW aircraft has established itself as a flexible and competent platform that has been acquired by various nations across the world. This aircraft made its first flight on November 28, 1997. In April of 1999, the Spanish Air Force ordered nine C-295 aircraft, which were ultimately put into service in 2001. Global customers have ordered 283 C-295 aircraft as part of International orders and deliveries. As of date, 212 aircraft have been delivered, while 210 are currently in service.⁶

From Europe to Asia, several nations have employed the C-295MW for various missions. This platform has been incorporated into the military fleets of European countries like Spain and Poland for use in transport and surveillance operations. Latin American nations such as Brazil and Chile rely on the C-295MW for maritime patrol and search-and-rescue missions along their extensive coastlines. In addition, African countries such as Egypt and Algeria have adopted this versatile aircraft for military and humanitarian purposes. Indonesia and Vietnam have acknowledged their ability to convey troops and supplies across rugged terrain in the Asia-Pacific region.

According to Military Balance 2023 data, the following nations operate multiple military versions of this aircraft.⁷ The C-295 aircraft in use include variants of C-295W, C-295 ISR, C-295 MPA, and C-295 AEW. Approximately 35 nations around the globe utilise C-295 aircraft:

- Asia: The Philippines, Bangladesh, Indonesia, Japan, Thailand, Vietnam
- Africa: Algeria, Angola, Burkina Faso, Côte d'Ivoire, Egypt, Ghana, Mali, Senegal
- Europe & Eurasia: France, Ireland, Poland, Finland, Romania, Czech Republic, Spain, Uzbekistan, Kazakhstan
- Middle East: Cyprus, United Arab Emirates, Jordan, Oman, Turkey
- North & Latin America: Brazil, Canada, Chile, Ecuador, Mexico

Accidents and Safety Record of C-295 Aircraft

The aviation sector, encompassing both civilian and military aviation, places significant importance on ensuring safety measures are rigorously implemented. This is exemplified by the meticulous testing and accreditation procedures that aircraft are required to undertake before their operational deployment. Implementing continuous maintenance practices, comprehensive training programmes, and periodic safety audits are essential in guaranteeing any aircraft's sustained safe functioning, including the C-295.

The C-295 has established itself as a reliable and adaptable workhorse in the global military transport aircraft fleet. While the C-295 is generally considered a reliable and safe aircraft, like any complex machine, it is not immune to accidents. Accidents involving military aircraft are subject to comprehensive investigations by relevant authorities, and findings are often used to improve safety protocols and engineering standards. The C-295 had a relatively favourable safety record compared to other military transport aircraft in its class. Accidents involving C-295s have been infrequent, and most have been attributed to human error, adverse weather conditions, or technical malfunctions.

The IAF employs a comprehensive and systematic training framework characterised by precision, rigour, and professionalism. This training pattern ensures that the air and maintenance crew are proficient in operating any system, including newly acquired aircraft.

As per a database result,⁸ Table 2 shows only two fatal air crashes of C-295 aircraft belonging to Polish and Algerian Air Forces in 2008 and 2012, respectively. Both fatal accidents were attributed to human error in terms of inexperienced crew. Other occurrences are of minor nature.

Table 2: Accidents/Incidents of C-295 Aircraft

12 occurrences in the ASN safety database						
acc. date	type	reg.	operator	fat.	location	dmg
15-AUG-2006	CASA C-295M		Spanish Air Force	0	Baghdis	sub
* 23-JAN-2008	CASA C-295M	019	Polish AF	20	1,3 km SE of Miroslawiec Air Base	w/o
-JUN-2008	CASA C-295M	T.21-09	Spanish Air Force	0	Los Llanos AB	sub
* 09-NOV-2012	CASA C-295M	7T-WGF	Algerian AF	6	W of Saint-Germain-du-Teil, Lozère	dst
27-FEB-2016	CASA C-295M	2800	Força Aérea Brasileira (FAB)	0	Alto Alegre, RR (SWUQ)	unk
22-JUN-2017	CASA C-295		Armed Forces of the Republic of Kazakhstan	0	Warsaw Chopin airport	unk
03-APR-2019	CASA C-295M	T.21-10	Spanish Air Force (Ala35)	0	Santa Cilia De Jaca Airport (LECI), Huesca	sub
22-JAN-2020	CASA C-295M	GHF552	Ghana Armed Forces	0	Accra Air Force Base	unk
23-MAR-2020	CASA CN-295M	A-2909	TNI-AU - Indonesian Air Force	0	Bintang Mountains Regency, Papua	min
04-MAY-2020	CASA C-295M	0. red	Kazakhstan Air Defence Force	0	Zhetygen Airport	min
10-JUN-2021	CASA C-295M	16702	Força Aérea Portuguesa	0	Ilha Do Porto Santo	min
05-JAN-2023	CASA C-295M	3205	Fuerza Aérea Mexicana (FAM)	0	near Culiacán-Fedl de Bachigualato Airport (CUL/MMCL)	unk

Source: "ASN-Aviation Safety Network Database results", *Aviation Safety Network*, <https://aviation-safety.net/wikibase/dblist.php?AcType=C295>. Accessed on September 15, 2023.

The IAF employs a comprehensive and systematic training framework characterised by precision, rigour, and professionalism. This training pattern ensures that the air and maintenance crew are proficient in operating any system, including newly acquired aircraft. In addition to providing basic training, it entails conducting routine inspections and implementing cutting-edge technology systems to identify possible problems before they become severe enough to cause accidents. The training also provides sufficient impetus for taking proactive measures to improve safety measures, reviewing lessons learned, and exchanging best practices to reduce and nullify the occurrence of accidents to improve the overall safety record

Make in India Initiative

The acquisition of 56 C-295MW aircraft will significantly boost the Make in India initiatives. The deal is the first of its kind, as India moved from its conventional aircraft manufacturing agency, Hindustan Aeronautical Ltd. (HAL), to the private company TASL for the manufacturing and assembly of military aircraft. Rightly so, as HAL, in its revival mode, is heavily booked with orders for fighters and helicopters such as Tejas Light Combat Aircraft (LCA) and Prachand Light Combat Helicopter (LCH). The partnership between Airbus and TASL will pave the way for the development of the industrial

ecosystem in the aviation sector. The process will include production, assembly, testing, certification, delivery, and maintenance for the complete lifecycle. It will attract huge investment and create several skilled and indirect jobs.⁹

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On October 30, 2022, a collaboration between Airbus and TASL commenced the construction of a pioneering manufacturing facility in Vadodara, Gujarat.¹⁰ This facility is intended to produce C-295 medium transport aircraft (MTA) specifically for the Indian Air Force (IAF). This manufacturing facility will produce 40 C-295s, of which 24 will be produced using a combination of imported kits and 30% locally sourced content, with the percentage of locally generated content for the other 16 platforms projected to double.

The Indian Coast Guard is expected to procure six C-295 Multi-Mission Maritime Aircraft variants. There is also a possibility of subsequent orders from the Central Armed Police Forces (CAPF), such as the Border Security Force. The concept of Aatmanirbharta has become a driving force behind India's efforts to enhance its transport aircraft capability. In line with the government's vision of reducing dependency on imports, the IAF has taken significant strides towards indigenously manufacturing and procuring transport aircraft. By promoting self-reliance, India aims to bolster its defence industry while minimising vulnerabilities arising from external suppliers.

The development and production of the C-295 fleet by TASL is a testament to this commitment. This strategic partnership not only strengthens domestic manufacturing capabilities but also enhances technological know-how through technology transfer agreements. Furthermore, fostering self-reliance in transport aircraft capability enables India to maintain operational readiness during crisis or supply disruptions. The Vadodara C-295 facility has the potential to serve as an export hub for the MTA and fulfil the role of a maintenance, repair, and overhaul (MRO) vendor for around 15 countries in the Asia-Pacific area. These countries include Egypt, Indonesia, Bangladesh, Jordan, Mali, Kazakhstan, Oman, the Philippines, Vietnam, Thailand, Saudi Arabia, the United Arab Emirates, and others.

Conclusion

The IAF has long recognised the critical importance of bolstering its airlift capability to meet evolving defence requirements. With expanding territorial responsibilities and the need for rapid deployment of troops, equipment, and humanitarian aid, the IAF requires a robust fleet capable of performing diverse missions. The existing aircraft inventory with ageing Avro and An-32 aircraft fleets falls short in payload capacity and operational range, hindering effective strategic airlift operations. To address this gap, the

induction of the C-295 fleet presents a significant opportunity for the IAF to enhance its airlift capabilities. This advanced transport aircraft offers superior versatility, extended range, and increased payload capacity, enabling efficient transportation of troops, cargo, and medical evacuations in domestic and international scenarios. With indigenous production and technology transfer agreements in place, there is tremendous potential for further development and customisation of these aircraft to suit India's specific needs. Overall, the C-295 fleet holds immense promise for strengthening the IAF's airlift capability and bolstering its overall operational effectiveness aligned with much-needed self-reliance capability. The C-295 fleet will be pivotal, elevating the Indian Air Force's airlift capability to new heights.

Notes:

- ¹ “1st C295 delivered to IAF” YouTube video, Defence Decode, September 13, 2023. <https://www.youtube.com/watch?v=jPQGIp4RDSc>. Accessed on September 15, 2023.
- ² *Brahmand World Defence Update 2023*, (New Delhi: Pentagon Press LLP, 2023), p. 149.
- ³ “C-295M Twin-Turboprop Transport Aircraft”, *Air Force Technology*, October 29, 2021, <https://www.airforce-technology.com/projects/c295/>. Accessed on September 16, 2023.
- ⁴ n 2.
- ⁵ “C295 MPA/ASW”, *Airbus*, <https://www.airbus.com/en/products-services/defence/military-aircraft/c295/c295-mpa-asw>. Accessed on September 15, 2023.
- ⁶ “C295”, *Airbus*, <https://www.airbus.com/en/products-services/defence/military-aircraft/c295>. Accessed on September 16, 2023.
- ⁷ The International Institute for Strategic Studies, *The Military Balance 2023*, (London: Routledge, 2023), pp 33-78.
- ⁸ “ASN-Aviation Safety Network Database results”, *Aviation Safety Network*, <https://aviation-safety.net/wikibase/dblist.php?AcType=C295>. Accessed on September 15, 2023.
- ⁹ “India receives first C-295 MW transport aircraft for Indian Air Force”, All India Radio News, September 13, 2023, <https://newsonair.gov.in/News?title=India-receives-first-C-295-MW-transport-aircraft-at-Seville-in-Spain&id=467653>. Accessed on September 15, 2023.
- ¹⁰ Amit Cowshish. “Will Deal to Manufacture C-295 Aircraft Prove Pivotal for India's Defence Production?”, *The Wire*, November 4, 2022, <https://thewire.in/government/airbus-tata-c-295-transport-aircraft-pivotal-defence-production>. Accessed on September 17, 2023.



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