100 KNOTS

India's Aviation
Ecosystem

December Fleet Report
Scheduled Operations

Indian Armed Forces
Fleet Report 2024

CIRIUM On-Time
Performance
Review 2023

Safety
Organizational Culture
& Safety

Helicopter
Operations
Staying In the VFR 'Coop'

SriLankan Airlines
Challenges
Privatization & Future
Outlook
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EDITOR'S LETTER
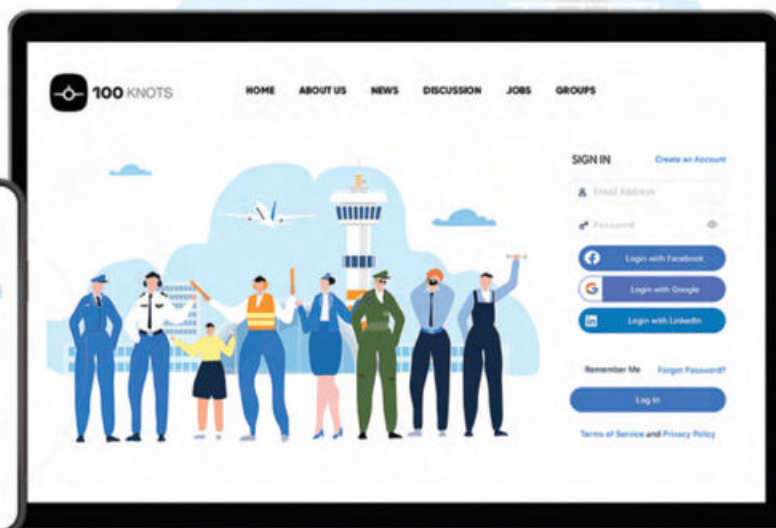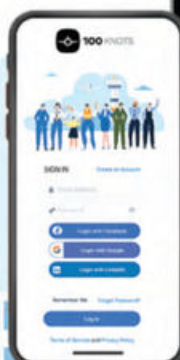
Radhika Bansal
Assistant Editor

Dear Colleagues,

Welcome to the January 2024 issue of the 100 Knots Magazine.

In 2023, India's aviation sector soared to new heights, marked by significant milestones and transformative developments. The year witnessed a surge in domestic and international air travel, with airlines adapting to a post-pandemic landscape and implementing innovative strategies to ensure passenger safety and comfort. The government continued its focus on bolstering regional connectivity, inaugurating new airports and expanding existing ones to facilitate seamless travel across the country. Technological advancements took center stage, with Indian aerospace companies making strides in sustainable aviation fuel research and the development of next-generation aircraft. The defense aviation sector showcased remarkable achievements, including successful test flights of indigenous fighter jets and advancements in unmanned aerial vehicle capabilities. Despite challenges, the resilience and adaptability of the Indian aviation industry in 2023 demonstrated its commitment to progress, setting the stage for a future where the skies are boundless.

In this edition, we delve into the intricacies of the aircraft fleet that graces Indian airspace, we uncover a fascinating tapestry woven with a diversity of wings, each contributing to the nation's air mobility in its unique way. From the iconic passenger planes connecting the vast expanse of the subcontinent to the cutting-edge military aircraft safeguarding national borders, the aircraft fleet of India stands as a testament to innovation, capability, and the dynamic spirit propelling the nation's aviation landscape forward.

As we stand at the threshold of the future, 100 Knots aims to be your go-to guide into the rapidly evolving landscape of Indian aviation. We promise to deliver succinct insights, captivating stories, and a window seat view into the trends and innovations shaping our skies.

Fasten your seatbelts, dear readers, as we take off, navigating the ever-expanding horizons of Indian aviation. Here's to the pilots, engineers, and visionaries who make our flights seamless and our aspirations boundless.

Clear skies and happy reading!

TABLE OF CONTENTS

December Fleet Report

Scheduled Operations

Deliveries

AIR INDIA		VT-RTH	01-Dec	Airbus A320 NEO	Air India
express		VT-BXB	01-Dec	Boeing B737-8 MAX	Air India Express
AIR INDIA		VT-RTG	07-Dec	Airbus A320 NEO	Air India
IndiGo		VT-IQO	07-Dec	Airbus A320 NEO	IndiGo
IndiGo		VT-IQM	08-Dec	Airbus A320 NEO	Indigo
express		VT-ATE	08-Dec	Airbus A320 NEO	Air India Express
vistara		VT-TQT	09-Dec	Airbus A320 NEO	Vistara
express		VT-BXH	09-Dec	Boeing B737-8 MAX	Air India Express
vistara		VT-TQU	13-Dec	Airbus A320 NEO	Vistara
IndiGo		VT-IRL	14-Dec	ATR 72-600	IndiGo
SpiceJet		9H-TJF	14-Dec	Boeing B737-800	SpiceJet
AIR INDIA		VT-RTI	15-Dec	Airbus A320 NEO	Air India

		VT-BXE	16-Dec	Boeing B737-8 MAX	Air India Express
		VT-ATG	18-Dec	Airbus A320 NEO	Air India Express
		YL-LDF	20-Dec	Airbus A320-200	IndiGo
		VT-BXI	21-Dec	Boeing B737-8 MAX	Air India Express
		VT-JRA	23-Dec	Airbus A350-900	Air India
		VT-YAW	28-Dec	Boeing B737-8 MAX	Akasa Air
		VT-TQV	28-Dec	Airbus A320 NEO	Vistara
		VT-YAU	29-Dec	Boeing B737-8 MAX	Akasa Air
		VT-IQL	29-Dec	Airbus A320 NEO	Indigo
		VT-RTU	30-Dec	Airbus A320 NEO	Air India
		VT-IQN	30-Dec	Airbus A320 NEO	IndiGo
		VT-BXC	30-Dec	Boeing B737-8 MAX	Air India Express

AIR INDIA

A319-100	A320-200	A320 NEO	A321-200	A321 NEO	A350-900	B777-200	B777-300ER	B787-800	Total
17	9	36	13	4	1	8	15	27	130

AIR INDIA express

B737-800	A320-200	A320 NEO	B737 MAX 8	Total
26	23	5	9	63

vistara

A320 NEO	A321 NEO	B787-900	Total
51	10	6	67

IndiGo

A321 NEO	A321 P2F	A320 200	A320 NEO	ATR 72	B777-300ER	Total
94	3	31	184	43	2	357

SpiceJet

A340-300	B737-700	B737-800	B737-900ER	B737 MAX 8	DHC-8	Total
1	8	17	3	13	23	65

Akasa Air

B737 MAX 8	Total
22	22

A320-200	A320 NEO	Total
5	49	54

ATR 42	ATR 72	Total
2	18	20

ERJ 145	ERJ 175	Total
5	3	8

BLUE DART

B737-800	B757-200	Total
2	6	8

flybig

DHC-6	Total
2	2

(Data as of 31-Dec-2023)

Active Indian Military Aircraft

Fleet Report

January 2024

Combined Military Fleet Size

2296

Tanker

6

Transport

264

Global Share

4%

Combat Aircraft

736

Combat Helicopter

869

Percentage Change from Last Year

+4.36%

Special Mission

70

Training

351

Indian Airforce

Special Mission

Boeing B707 — 1

Boeing B737 — 2

Embraer ERJ 145 — 3

Gulfstream G100 — 2

Bombardier Global 5000 — 2

Gulfstream III — 3

Ilyushin IL 76 — 3

Tanker

Ilyushin IL 78 — 6

Combat Aircraft

SEPECAT Jaguar — 130

Mikoyan MiG 21 — 127

Mikoyan MiG 29 — 65

Dassault Mirage 2000 — 44

Dassault Rafale — 36

Sukhoi Su-30 — 226

HAL Tejas — 32

100 KNOTS

Transport

Airbus A321 — 4

Antonov AN-32 — 103

Boeing C 17 — 11

Lockheed Martin C 130J — 12

Airbus C 295 — 1

Dornier 228 — 58

Hawker Siddley HS 748 — 58

Ilyushin IL 76 — 17

Combat Helicopter

Boeing AH-64 — 22

Boeing CH-47 — 15

HAL Dhruv ALH — 111

Mil Mi 17 — 222

Mil MI-24/25/35 — 15

HAL Prachanda (LCH) — 5

Aerospatiale SA 315 — 18

Aerospatiale SA 316/319 — 77

Training

BaE Hawk	102		SEPECAT Jaguar	30
BaE Hawk	77		Dassault Mirage 2000	11
Mikoyan MiG 29	10		Pilatus PC-7	75

Indian Army

Combat Helicopters

ALH	220		Aerospatiale SA 315	40
HAL Prachanda (LCH)	3		Aerospatiale SA 316	4

Indian Navy

Combat Aircraft

Mikoyan MiG 29 — 36

Combat Helicopter

HAL Dhruv ALH — 24

Kamov Ka-28 — 14

Sikorsky S-61 — 6

Sikorsky S-70 — 6

Aerospatiale SA 316/319 — 42

Westland Sea King 42 — 25

Special Mission

Boeing Poseidon P-8 — 12

Britten Norman BN-2 — 127

Mikoyan MiG 29 — 65

Kamov Ka-31 — 14

Training

BaE Hawk 132 — 17

HAL Kiran HJT-16 — 20

Mikoyan MiG 29 — 9

CIRIUM On-Time Performance Review 2023

Timely airline operations are the lifeblood of seamless travel. On-time performance isn't just a convenience for passengers; it's a cornerstone of customer satisfaction and operational efficiency. Punctuality ensures travelers reach their destinations without disruptions, fostering trust and loyalty. Beyond customer experience, it optimizes fuel consumption and operational costs, enhancing an airline's competitiveness. In an industry where minutes matter, prioritizing on-time performance isn't just a commitment to schedules; it's an investment in the reliability and success of the airline and the satisfaction of the passengers it serves.

Cirium has released the 2023 Annual On-Time Performance report which analyses and recognizes the world's airlines and airports who have demonstrated remarkable resilience, navigating through challenges, and adapting to changing market dynamics.

What is On-Time Performance?

The definition of an On-Time Arrival is when a passenger flight/ aircraft arrives at the gate within 15 minutes of the scheduled arrival time; an On-Time Departure is when a passenger flight/ aircraft departs the gate within 15 minutes of the scheduled departure time. On-time arrivals are used to rank airlines, and on-time departures are used to rank airports.

Most On-Time Airlines Worldwide

	On-Time Ranking	On-Time Arrival	Tracked Flights	Completion Factor	Total Flights	Summary of Top Performers
SA AVIANCA (AV)	1	85.73%	99.24%	99.08%	213,039	**Total On-Time Arrivals**
Azul (AD)	2	85.51%	98.43%	97.12%	310,972	**83.67%**
Qatar Airways (QR)	3	85.11%	98.34%	99.85%	183,090	
Delta Air Lines (DL)	4	84.72%	99.98%	98.82%	1,635,486	**Total Tracked Flights**
Iberia (IB)	5	84.38%	99.17%	98.69%	170,750	**99.08%**
LATAM Airlines (LA)	6	84.00%	98.70%	98.80%	508,721	
ANA (NH)	7	82.75%	99.96%	98.89%	302,279	
JAL (JL)	8	82.58%	99.90%	98.59%	308,302	**Total Flights**
Saudia (SV)	9	81.29%	97.19%	99.80%	174,256	**5,805,739**
American Airlines (AA)	10	80.61%	99.89%	98.93%	1,998,844	

Most On-Time Airlines Asia Pacific

	On-Time Ranking	On-Time Arrival	Tracked Flights	Completion Factor	Total Flights	Summary of Top Performers
ANA (NH)	1	82.75%	99.96%	98.89%	302,279	**Total On-Time Arrivals**
JAL (JL)	2	82.58%	99.90%	98.59%	308,302	**73.51%**
Thai AirAsia (FD)	3	82.52%	99.03%	99.98%	113,871	
IndiGo (6E)	4	82.12%	94.84%	99.34%	678,446	
Air New Zealand (NZ)	5	79.68%	99.10%	96.54%	175,876	**Total Tracked Flights**
Garuda Indonesia (GA)	6	78.67%	98.68%	98.85%	61,525	**96.81%**
Singapore Airlines (SQ)	7	78.57%	99.94%	99.92%	99,653	
Philippine Airlines (PR)	8	77.46%	98.54%	97.20%	106,720	**Total Flights**
Vietnam Airlines (VN)	9	77.46%	80.33%	99.13%	150,674	**3,763,980**
Cathay Pacific (CX)	10	76.32%	99.44%	99.58%	73,578	

Most On-Time Airports

	On-Time Ranking	On-Time Departure	Tracked Flights	Total Flights	Avg Dep Delay	Routes Served	Summary of Top Performers
Minneapolis-St. Paul International Airport (MSP)	1	84.44%	96.70%	289,817	63	157	**Total On-Time Departures** **78.16%**
Rajiv Gandhi International Airport (HYD)	2	84.42%	93.51%	168,426	53	82	
Kempegowda International Airport (BLR)	3	84.08%	90.38%	237,461	54	93	
El Dorado International Airport (BOG)	4	84.01%	87.74%	292,486	53	101	
Salt Lake City International Airport (SLC)	5	83.99%	99.85%	226,705	66	100	**Total Tracked Flights** **96.91%**
Detroit Metropolitan Wayne County Airport (DTW)	6	83.09%	99.76%	276,049	68	123	
Seattle-Tacoma International Airport (SEA)	7	82.97%	99.49%	399,583	54	126	
Philadelphia International Airport (PHL)	8	82.75%	97.98%	246,152	75	122	
Hamad International Airport (DOH)	9	82.04%	99.40%	223,952	41	191	**Total Flights** **6,748,934**
Haneda Airport (HND)	10	80.51%	99.08%	455,001	32	103	
Charlotte Douglas International Airport (CLT)	11	80.36%	98.62%	484,056	69	185	
San Diego International Airport (SAN)	12	80.32%	99.04%	189,479	59	82	
Washington Dulles International Airport (IAD)	13	80.26%	95.53%	212,599	71	140	**Total Seats** **1,082.56M**
Oslo Airport Gardermoen (OSL)	14	80.08%	97.41%	197,307	39	144	
Los Angeles International Airport (LAX)	15	79.76%	96.59%	503,851	63	194	
O'Hare International Airport (ORD)	16	79.67%	97.97%	679,614	68	247	
Phoenix Sky Harbor International Airport (PHX)	17	79.59%	98.00%	386,189	61	148	**Total Routes** **2,777**
Benito Juarez International Airport (MEX)	18	79.42%	96.27%	333,349	54	104	
Nashville International Airport (BNA)	19	79.30%	95.78%	203,893	62	110	
Hartsfield-Jackson Atlanta International Airport (ATL)	20	78.89%	99.04%	742,965	58	225	

Operational Highlights

	On-Time Departure	On-Time Arrival	Total Routes Served	Total Airlines Served
Minneapolis-St. Paul International Airport (MSP)	84.44%	84.62%	157	16
Rajiv Gandhi International Airport (HYD)	84.42%	80.81%	82	30
Kempegowda International Airport (BLR)	84.08%	77.79%	93	37
El Dorado International Airport (BOG)	84.01%	82.61%	101	35
Salt Lake City International Airport (SLC)	83.99%	84.71%	100	13

SriLankan Airlines

Challenges Privatisation & Future Outlook

Richard Nuttall
CEO, SriLankan Airlines

SriLankan Airlines is an award-winning carrier with a reputation for service, comfort and safety. Launched in 1979, SriLankan is currently expanding and further diversifying its wide range of products and services to drive the country's ongoing boom in tourism and economic development. The Airline's hub is located at Bandaranaike International Airport in Colombo, providing convenient connections to its global route network of 113 destinations in 59 countries (including codeshare operations) in Europe, the Middle East, South Asia, Southeast Asia, the Far East, North America, Australia, and Africa.

SriLankan has been through some very challenging times in the recent past. During Covid, the situation became more complicated with disrupted operations, Sri Lanka's economic crisis, the devaluation of the Sri Lankan rupee and non-availability of jet fuel. During this period, we also saw various instances of false reporting around the world, which gave the impression that Sri Lanka was unsafe, leading to travel advisories.

One of the biggest challenges now is manpower shortages. This is a global issue, but it has also been exacerbated in Sri Lanka due to the country's economic situation, which has caused many professionals to leave the country. There are no quick fixes, but a combination of pay increases, ramping up training at our own aviation college, external recruitment and outsourcing, and smarter working practices are being used to alleviate the situation.

However, if we keep these challenges aside, the Airline did pretty well. At the airline level, the company broke out even in over a decade in USD terms in the last financial year, and the airline's EBITDA was also at 10%, which is excellent. Going forward, we expect the Airline to make a healthy profit if revenue forecasts are achieved.

IMF Process, Restructuring & Privatisation

Sri Lanka is presently going through an IMF process. As a part of this process, the government is working to privatize some of the big state-owned enterprises including the airline. This is a two-step process. First the government is working to restructure the existing company debt, to make the company more attractive for investment, and then the second phase is to source investors.

Time will tell as to whether the privatization will be successful. But even with debt restructuring, the airline will be in a stronger position. The government has already been able to reduce the company's debt burden by about 30%, and we are working with the finance ministry and their advisors to find solutions to restructure a large chunk of the remaining debt.

Government has also set up a unit within the finance ministry called the 'State Owned Enterprise Restructuring Unit,' to manage the various privatizations. For the airline, they are working with the International Finance Corporation (IFC), which is part of the World Bank. At the moment they are looking for "Expressions of Interest" from potential investors. The goal is to complete privatization sometime in the middle of 2024. Though looking at how long it took to privatize Air India, this is an aggressive timeline.

Future Ambitions of the Airline

Our traffic comes mainly from the Sri Lankans living abroad and tourists to Sri Lanka from around the world, including India. In fact, India is Sri Lanka's biggest tourism market. We are presently flying to 9 cities in India and looking to increase it to 12 in the coming future.

We aim grow as quickly as we can. We believe that there will be demand for an airline double our size within 4 or 5 years. Sri Lanka has a unique geography in the Indian Ocean that allows us to be a hub for much of the Indian subcontinent and Indian Ocean, especially to the East.

The challenge that we currently have is funding. Even if you want to lease an aircraft, there's still a cost. So, we know where we want to go. If we don't privatize, it will probably take us a little longer than we would like, and if we privatize it is likely we may be able to grow more quickly.

© USAF

Benefits of Flying With SriLankan Airlines

The SriLankan fleet contains luxurious seats that have ample pitch and width. Seating is in a two-class system of Business and Economy. Business classes on long haul aircraft are equipped with full flat-bed seats. The AVOD in-flight entertainment system has the latest movies, TV and audio programmes. Complementing this facility are the wide screens with superior high resolution picture quality for infinite viewing pleasure. Also available is the air-show with forward and downward cameras. The Airlines' A330-300 fleet is equipped with the Thales Avant in-flight entertainment system and WIFI connectivity.

Fleet Expansion

SriLankan operates a fleet of 23 aircraft – including wide-bodied A330 aircraft, A321 aircraft and mid-range A320s.

	Airbus A330-300	7
	Airbus A330-200	4
	Airbus A320neo	2
	Airbus A320-200	5
	Airbus A321-200	1
	Airbus A321neo	4

Unfortunately, it's very difficult to procure new airplanes today. The supply chain disruption during the pandemic has affected everybody from aircraft to engine manufacturers who are still trying to regain total manufacturing and delivery capacity. All new aircraft orders are getting delayed, and the order books are full until 2027-28.

We are relatively small, so we don't need hundreds of aircraft. But whilst we know where we want to go in terms of growth, this will also depend on how quickly we can source aircraft, and this might also depend on the future ownership, if there are changes.

Sustainable Aviation Fuel

The biggest challenge with Sustainable Aviation Fuel (SAF) is its availability and cost. We are ensuring our capabilities to use SAF when available. We are absolutely committed to industry sustainability goals. But at the moment SAF is not available in Sri Lanka.

However, in Sri Lanka, we live in a beautiful country with abundant biodiversity. We have something here that we need to preserve for future generations. We are involved in several sustainability projects, including planting mangroves, mapping seagrass (which stores 36 times more carbon than traditional forests) around the Sri Lankan coasts, and supporting blue carbon research.

## Presence in India & Importance of Indian Aviation Market

I don't think that we can stress enough how important the Indian aviation market is for SriLankan Airlines. With 1.4 billion people, India is the most populous country in the world with strong economic growth.

India is also the biggest tourism market for Sri Lanka now. But we believe the numbers could easily be many times greater.

Codeshare & Interline Agreements with Indian Carriers

We have codeshare and interline agreements with Air India and Vistara and are talking to the other carriers. India is a vast country with many cities, and we would love to fly to many of them, but we also want to be able to connect to others, and sometimes, working with other carriers, we can provide better connectivity for both Indians going South and east to Sri Lanka capital and also for Sri Lankans going to the north and West to over Mumbai and Delhi.

Mr. Richard Nuttall has a wealth of airline industry experience spanning three decades and five continents, having held multiple Chief Officer and Board positions in aviation companies across the globe. With an exceptional record of delivering performance improvement and driving sustainable growth, his expertise includes airline turnarounds; restructuring; strategy development; mentoring; global leadership; revenue management; network planning; airline distribution and sales and digital strategy. Mr. Nuttall joined SriLankan Airlines as the Chief Commercial Officer (CCO) in November 2021 and was promoted to the position of Chief Executive Officer (CEO) in April 2022. Prior to this, he has been VP Sales with Saudia; Executive Board Member of Skyteam; Chief Commercial and Strategy Officer of Royal Jordanian; Chief Executive Officer of Bahrain Air; Commercial Director of Kenyan Airways; Chief Commercial Advisor at Philippine Airlines; and Vice President Sales and Marketing-Americas of Polar Air Cargo Inc. He spent his first decade in the industry in various roles with Cathay Pacific Airways.
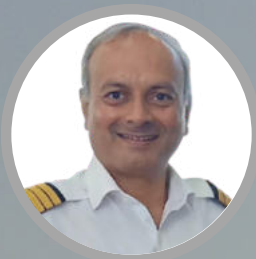
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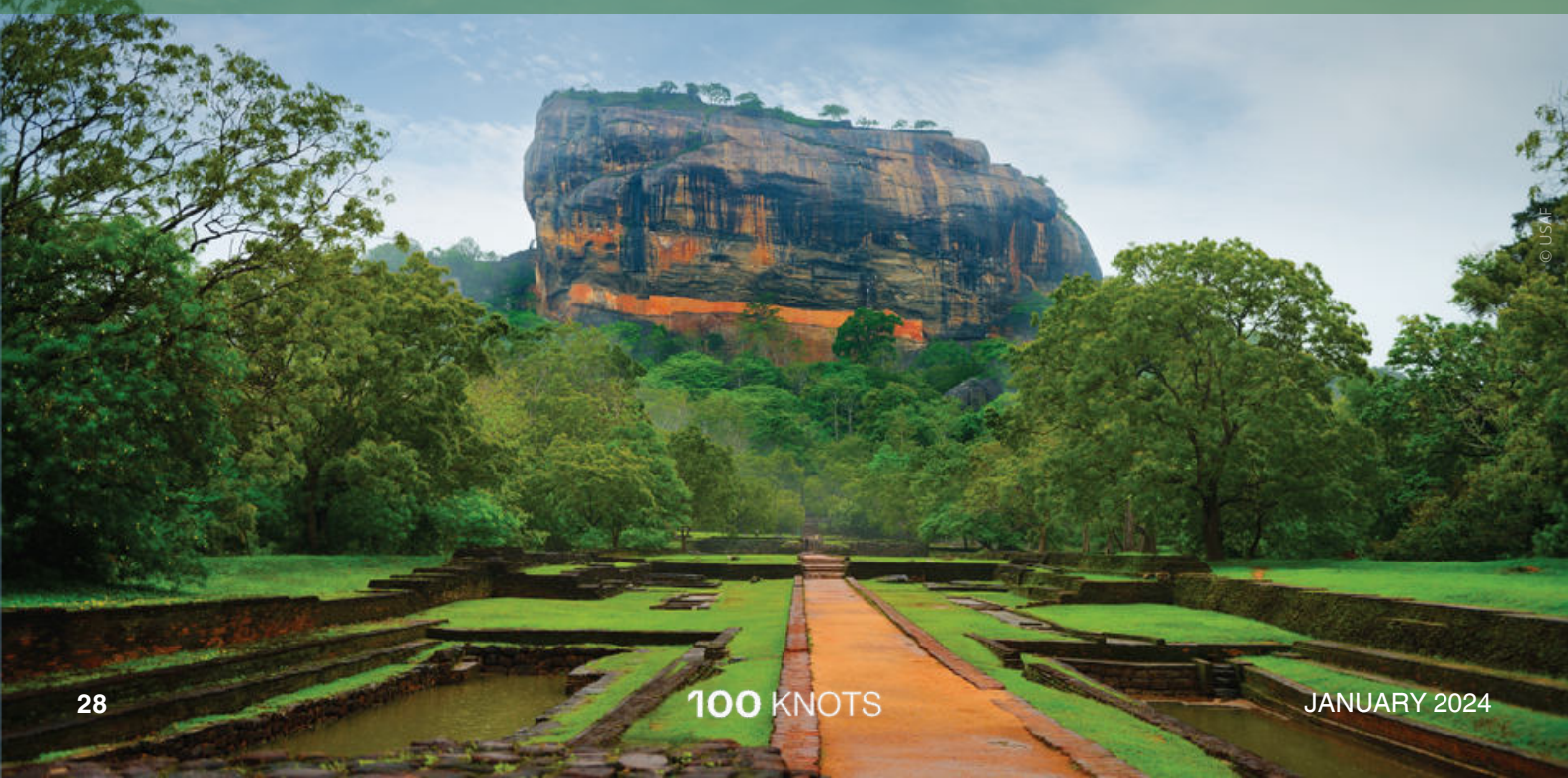
Staying In The VFR 'Coop'

Indian Helicopter Operations

(VFR Visual Flight Rules)

Capt. Peeush Kumar
TRE H145

© Neil Mark Thomas

'Coop' or a birdcage in the title recalls an observation in famous 'Aravind Adiga' authored book and later movie called 'The White Tiger'. Protagonist Balram in this book relates temperament of Indian underclass akin to chickens in a 'rooster coop'; chickens in cages routinely see culling amongst them but none attempts to escape the cage despite imminent danger. This systemic 'rooster coop' disposition draws parallel with Indian helicopter sector pursuing affinity for operations under VFR, even where safer alternatives are feasible. Continued pursuit of helicopter operations under VFR when conditions dictate flights under IFR (Instrument Flight Rules) is the moot point. Resulting catastrophes/incidents perpetuate the unfortunate safety record manifesting into low consumer confidence and limited sectorial growth.

Legacy orientation of helicopter operations have influenced effective exclusion of this sector from nation building schemes like RCS-UDAN/ 'Gati Shakti' where a major scope exists. Limited scope operations naturally translate into limited revenues, flat remunerations and sector stagnation. Succeeding arguments are a comment about favouring an 'IFR appropriate ecosystem' wherever possible, and not intended to undermine the exclusive 'VFR-only' roles/flights/helicopters framework. Arguments are based on investigated roles of stakeholders, visualised alternatives with open-source data in support. It is attempted to trigger motivation of willing minds for safer helicopter operations under IFR for reliable, efficient and round-the-clock (24 x 7) transfers as an enabler for national building schemes.

Ecosystem of context is influenced by pilots, operators, AAI (Airport Authority of India) and DGCA (Directorate General of Civil Aviation). Traditionally, helicopters have been operated predominantly under VFR between heliports where instrument-based operations were uneconomical. Aeroplanes with suitable avionics and equipped airports have since transitioned to safe, reliable and efficient operations under IFR. Feasibility for equipped helicopters to operate under IFR from established heliports is a recent development by ICAO (International Civil Aviation Organisation) to accrue safety and efficiency under PBN (Performance Based Navigation) concept.

Helicopter pilots, a major stakeholder in said ecosystem are vulnerable to contagion of comfort zone leaning on 'Chicken-Egg' paradox. Routine helicopter operations present limited prospects for operations under IFR even for qualified crew and equipped helicopters. Current heliports don't afford opportunities to pilots for 'comfort-currency' with IFR procedures while controllers at airports consider VFR as default for helicopters. Alienated 'comfort-zone' of helicopter pilots for operations under IFR thus makes VFR operations dearer even when weather conditions warrant otherwise. Company's management too, largely composed of senior pilots naturally aligns with stated operational bias. 'Misfitting' VFR operations by helicopters are therefore sustained without a course correction at organisational level.

In India, procedures under IFR are currently available only at airports. Resistance by air traffic controllers to accept helicopter traffic under IFR especially at major airports surfaces the favoured 'Special VFR' clearance. It might be known that under VFR, keeping safe from terrain, obstacles and other traffic is dependent on how much pilots can see outside the cockpit. Interestingly, during degraded/poor visibility conditions these challenges are nonetheless undertaken under 'Special VFR' clearance (!). Nevertheless, unlike for aeroplanes, 'Special VFR' clearance instead of the safer IFR option is the preferred alternative by ATC for helicopters. This conjecture aligns with inferred position at AAI (Air Traffic Controllers are organised under AAI) wherein construction of IFR procedures at heliports remain unjustified against associated trade-offs. Since only AAI undertakes construction of IFR procedures in India, above could be corroborated by existence of NIL Indian heliports licenced for operations under IFR.

Challenges and Recommendations

Back to 'Chicken-Egg' paradox, while negligible helicopter operations under IFR are owed to lack of infrastructural support, helicopter-specific infrastructure is left undeveloped by AAI by its perceived (non)utility for helicopters. The systemic 'rooster coop' analogy may thus seem befitting the helicopter sector where pilots, operators, AAI and DGCA in full knowledge of 'opportunity cost' of operations under IFR display very limited intent for a change. Such opportunity costs are disproportionate and sometimes even catastrophic, but yet fail to influence decision makers at organisational and institutional levels.

Breakaway from the conundrum obviously lies in infrastructure development at heliports to enable routine operations under IFR. This infrastructure development is envisaged under helicopter specific PBN operations at frequently visited heliports (Excludes temporary heliports). This would also be a straight solution to ease out high traffic density at major airports since helicopters would be routed only to proposed heliports even during poor weather conditions. Fortunately, regulations to facilitate said helicopter operations have already been promulgated by DGCA. These however remain to be realised as yet. General apprehensions against helicopter-oriented contemporary measures at AAI and DGCA may therefore need intervention. Awareness about helicopter specific operations under PBN, documentation covering ATM/ASM protocols and a 'Pilot' project for countrywide injection could be considered for the purpose.
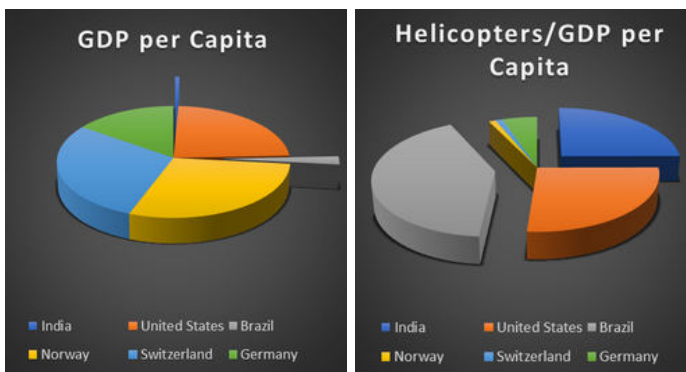
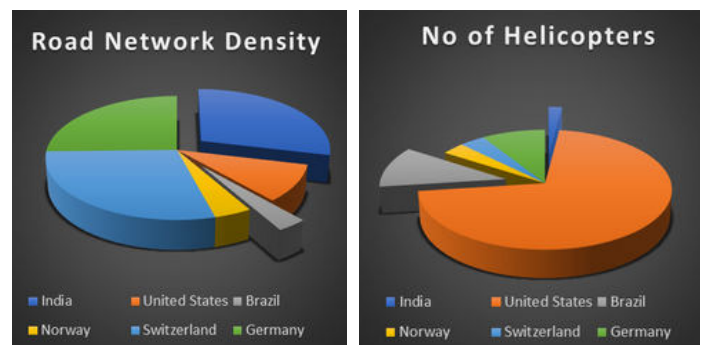# Commercial Viability: Heliport Operations Under IFR

Perception against business viability of IFR heliports in India is possible to be addressed using open-source data. A sample size of six countries (including India) was selected to reflect on speculations about affordability and sustainability of heliport operations under IFR. Norway, Switzerland and Germany were obvious choices attributed to their extensive deployment of helicopter specific PBN operations. Brazil with high density of helicopters, and USA for its large land-mass suited for helicopter operations and supporting economic strength was considered. Since presented data is open-source, it was rational to visualise it relatively instead of absolute figures. Chart on the left presents 'GDP per capita'[1] as a general measure of affordability compared with 'Helicopters/GDP per capita' in second chart. It might be expected that countries with better GDP/capita ratio would also fare better under Helicopters/ 'GDP per capita' ratio.

'Pulled-out' blue slice in the pie-chart represents Indian data and the 'pulled-out' grey slice represents that of Brazil. These two countries are similarly represented in succeeding charts for general proximity of context. It may be observed from the 'size' of pie-slices in above charts that corresponding 'GDP/capita' attribute has little influence on helicopter population. 'Thinner' pie-slice for India and Brazil representing the 'GDP/capita' ratio, corresponds to

counter-intuitive (better) Helicopter/ 'GDP per capita' ratio; higher 'GDP/capita' for Switzerland and Norway on the other hand corresponds to weaker Helicopters/ 'GDP per capita' ratio. This observation is significant and contradicts the nominal view about ill-affordability of said helicopter operations in developing countries like India. Global examples discard possible theory about non-viability of proposed IFR heliports in Indian context, if it so exists.

Previous charts vindicate argument for helicopter population being independent of 'GDP/capita' ratio. Similarly, comparison of road density network (Km/100km2)[3] with number of helicopters in a country brings forth an interesting relationship. As observed from charts below, number of helicopters in each country is inversely proportional to road density in a country; wider Indian road density corresponds to fewer helicopters, while higher no of helicopters in Brazil correspond to its weaker road density. Representative data for USA, Switzerland and Germany also corroborates this observation. So, weaker the road network, higher is the potential of helicopter population. Combining with preceding conclusion about affordability, it seems justified that the 'still improving' rail/road infrastructure in India offers conducive growth opportunity for helicopter sector.

Finally, potential of heliport infrastructure provides meaning to monetary investment through returns and hence an economic viability/sustenance. This is true irrespective of development undertaken via PPP model like Norway/Switzerland, or by the government like in India/Brazil. Potential of heliport infrastructure could be reflected by 'number of helicopters per heliport' in a country. This metric is reflective of operational versatility at a heliport for efficiency of investments. It implies utility/business potency of heliports enabled by its location and operational inclusivity; all weather, day/night – IFR capable. A high ratio of this attribute (Number of Helicopters per Heliport) is analogous to consumer volume in a store. Incidentally, CAG vide report No 22 of 23 on RCS-UDAN scheme is vocal about the evidently missing eligibility and potential criteria in heliport selection[4] under the scheme.

Chart below may be viewed with above preamble and the knowledge that helicopter specific operations under IFR are most frequent in Norway, Switzerland and Germany than other countries considered in 'Pie chart'. Better ratio of 'Helicopters per Heliport' observed for Switzerland, Norway and Germany suggest wider potential of operations (VFR & IFR). As previously, 'pulled out' slices are representative of Indian and Brazilian data respectively in blue and grey colours. Potency of operations at a heliport directly influencing a business case is therefore implied.


Two significant elements are drawn from above analysis. Firstly, irrespective of heliport infrastructure development via PPP or government, an economically viable proposition could only be expected if the heliport permits inclusive operations under IFR and VFR. It therefore says that proposed Indian heliport infrastructure be developed for helicopter specific IFR operations under PBN concept. Secondly, selection of heliport locations must be based on deliberate analysis of estimated operations from each heliport to support sustainability. Observation vide CAG's report no 22 of 2023 on RCS-UDAN scheme about NIL sustenance of heliports after government's financial aid is brought to attention.

Opportunity in Waiting

Consolidating on need for heliport operations under IFR for commercial viability to trigger growth in helicopter sector, ongoing infrastructural impetus is noteworthy. Focus on infrastructural development is in the sweet-spot where contemporary technological advancements in aviation can support government schemes like RCS-UDAN/ 'Gati Shakti'.

Under RCS-UDAN scheme, segment of 'up to 400km' distance being the primary domain of helicopter operations may be considered. Unfortunately, this segment had dismal results [5] under RCS-UDAN scheme possibly related to limited contribution by helicopters. Embracing proposed IFR operations from heliports, this segment could be helped to connect major airports especially in mountainous areas of North and North-East India. Dependable, consistent and economically self-sustainable operations under IFR from remote areas could be enablers of last mile connectivity in national connectivity schemes. Spirit of RCS-UDAN scheme visualised below helps observe the criticality of 'feeder' remote-area '400km segments' for major airports which can be addressed by helicopter sector being its natural domain.
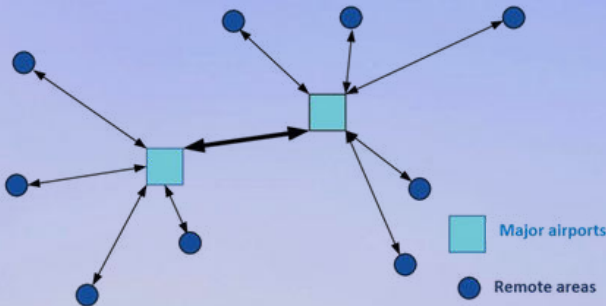
Capitalising on discussed opportunities requires careful plugging of present-day voids in helicopter sector through a structured, incremental approach. A 'Pilot' project on a small scale to identify and iron-out nuances may thus be considered. An incremental step could assist stakeholders in developing integral framework necessary for subsequent scaling up to national level.

Preliminarily, following may be considered at organisational and institutional levels to establish feasibility and later scalability of the proposed 'Pilot' project. Being a novel approach impacting nation-building government schemes, it may be appropriate for it to be steered by Ministry itself (Ministry of Civil Aviation; MoCA): -

- **Development of Heliport Infrastructure under IFR -** Hilly terrain with limited road connectivity in Northern and North-Eastern Regions may be considered for said 'Pilot' project to accrue maximum advantages. AAI may develop two to four heliports with IFR infrastructure under PBN concept for linking up with identified airport(s) under RCS-UDAN scheme. (Said heliports having a wide presence in west may help subside initial apprehensions)

Major airports

Remote areas

100 KNOTS

- **Single-Pilot Helicopter Operations under IFR** Proposed initiatives necessitate larger population of skilled pilots. DGCA may consider measures for complementing population of trained helicopter pilots to match projected scope of nation-wide operations. Facilitating single pilot operations under IFR is one viable solution to the challenge. It may be known that single pilot operations under IFR are already provisioned for aeroplanes in India, but capped for helicopters. This 'cap' restricts scope of operations and possibly impacting contribution by helicopters in nationwide schemes.

- **Participation of Private Helicopter Operators** Role of Pawan Hans Limited (Public Sector Undertaking) in shaping helicopter operations under RCS-UDAN scheme has been far from praiseworthy . It may therefore be considered to invite private sector helicopter operators for wider participation and possibilities at planning levels. Economic prudence for self-sustainable operations may also be better reflected by private sector as required under RCS-UDAN scheme. The most important advantage would however be deliberations on contemporary ideas for an upward trajectory.

About the Author

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[1] https://knoema.com/sijweyg/world-gdp-per-capita-ranking-2022-data-and-charts#:~:text=World%20GDP%20per%20Capita%20Ranking%202022%20%7C%20Dat...&text=Based%20on%20this%20approach%2C%20Qatar,world%20while%20Luxembourg%20ranks%20second

[2] https://en.wikipedia.org/wiki/List_of_countries_by_number_of_heliports

[3] https://en.wikipedia.org/wiki/List_of_countries_by_road_network_size

[4] Recommendation No 2 against report para 3.1.3 at https://cag.gov.in/en/audit-report/details/119178

[5] Chart 3.1 of CAG report no 22 of 23 at https://cag.gov.in/en/audit-report/details/119178

[6] Para 5.1.2 of CAG report no 22 of 23 at https://cag.gov.in/en/audit-report/details/119178

100 KNOTS

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Organizational

Culture & Safety

Group Captain Sushil Bhatia (retd)
Indian Air Force

Being a certified Life Coach, I know that stories significantly impact us. Hence, I convey the messages through life stories, most of them experienced by me.

I remember my good old days of IAF when I was posted to one of the forward bases. I was heading the 2nd Line servicing of the only Swing-wing aircraft in the world, MiG 23/27. At that time, there were two squadrons of the aircraft operating there. And a third one was moving from another location to this station.

On hearing the news, our Chief Engineering Officer called me to his office and cautioned: " Be careful of the incoming bunch of technicians and engineers. They do not have a good maintenance culture. There are bright chances that your present men also would be spoilt in no time". And for sure, that was to come true. We started having difficulty keeping the technicians under maintenance discipline, which was so easy until some time back. More and more technicians were found visiting the cafeteria outside allowed hours. The incidents of losing tools started increasing. There were instances where the tools were found inside the cockpit. Safety margins could be seen as being compromised.

Does culture have anything to do with this?

As a Senior Professor at the Defence Institute of Armament Technology (DIAT), Deemed to be a University under MoD, I used to take PG students to the TATA Motors factory in Pune. On each visit, I found three things noticeable:

1. For lunch breaks between 1300 and 1330 hrs, you could only find people in the cafeteria after 1300 and before 1330.
2. A vehicle used to roll out every 60 seconds from the factory, as claimed.
3. We could not find anybody loitering around here and there.

These observations are indicative enough of a healthy, strong culture.
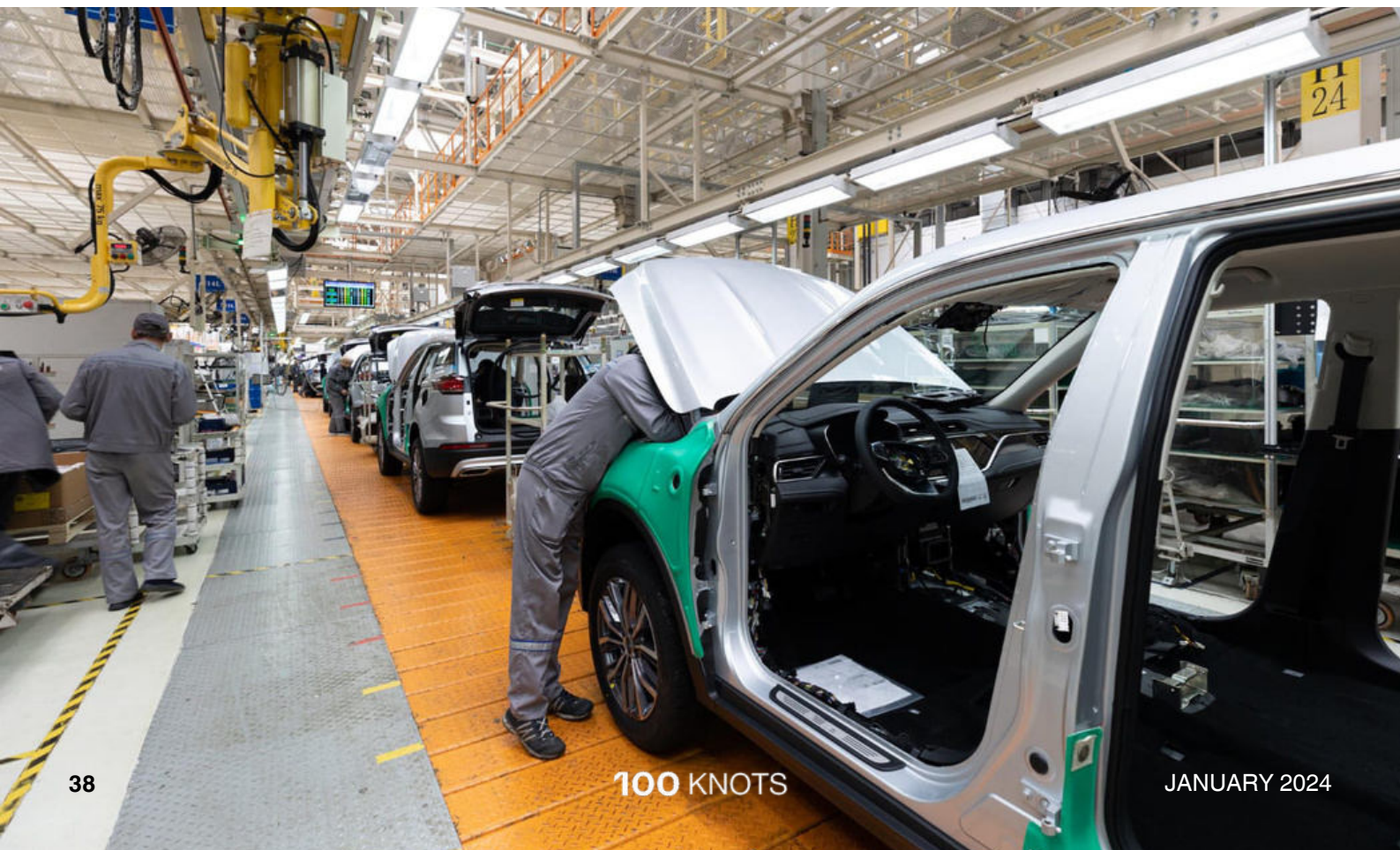
How do you define an OC?

It simply means "the way things are done around here. "Culture is a congregation of ideas, assumptions, and beliefs shared by the majority. It is influenced by factors like history, type of products, market, technology, strategy, type of employees, management styles, national culture, etc.

A simple example from our homes. I have learned from my grandmother and my mother that on the eve of the Deepawali festival, we all light up earthen lamps with mustard oil; all family members sit together and worship Goddess Lakshmi; visit the near and dear ones and wish them luck, and so on.

A strong culture is one people can clearly relate to and understand.

How do we see the interplay of cultures in the aviation environment?

When we peek into the cockpit cultures, we sometimes talk of Power Distances amongst the flight crew. That means authoritative distance being maintained or created amongst them. That means a co-pilot, junior to the PIC, will need help communicating with the PIC, especially in the required instances.

The crash of Korean Air Flight 801 in 1997 was attributed to the pilot's decision to land despite the junior officer's disagreement. In this case, the PIC continued to land on a lousy weather airfield, with reduced visibility and non-availability of ILS, despite advice by the co-pilot and engineer against the landing, a case of higher Power Distances, as noted by the investigating agencies.

Safety Culture is how an organization perceives, values, and prioritizes safety. It reflects the absolute commitment to safety at all levels in the organization. It has also been described as "how an organization behaves when no one is watching."

So, the incident dates back to a few years from now. I was newly appointed to an airline. One of my good friends advised me to watch things for six months before getting into action. That way, you can study and see the organizational culture in various aspects. A professional auditor that IATA has trained me, I am always observant of the things happening around me. So, one of the days, I was walking by when I saw so many fire extinguishers mounted on the walls. (You realize their importance only when you need them, and then you realize that you do not know how to fire them, or even if you press the trigger, they will not come into action).

To my surprise, all the fire extinguishers on that floor were overdue for their monthly checks. The same was the case with all fire extinguishers on all three floors. As advised by my older friends in the airlines, I mailed the In-charge Admin to get them serviced. It was two weeks before I decided to connect with GM (Admin) and explain the situation. Well, the GM seemed busier than his I/C, and again, nothing happened. I raised the matter with VP Adm., hoping for some action. But alas!

Meantime, one of the days, I walked into the airline's call center and asked the supervisor why the fire extinguishers had yet to be serviced in time. And his answer shocked me. He retorted: "Sir, there has not been any fire for the last 15 years; how do you think there would be any fire now!". How the matter reached the Accountable Manager, I was told not to approach AM directly, and the extinguishers were serviced is another story. This narration shows the organizational safety culture. All laid back and hoping that nothing would go wrong! (If nothing has happened for some time, the stakeholders have a cause for worry!).

I came across an MRO with no culture of having actual employee training wherever it could be avoided. It was the culture to sign the certificates of training and manage. I noticed this organization was working to fake the classroom settings and take photographs.

Remember, the top management always makes efforts to set up the culture. It is a top-down approach. Of the 500 executives surveyed from the service industry, Organisational Culture was cited as one of the most overlooked, though crucial, factors in deciding the company's safety system implementation and running.

Safety Implementation vs. OC

I will quote a case study here. In a large manufacturing company, there had been recurring injuries to the machine operators over time. The management repeatedly emphasized the safety aspect of the operations, planned for rigorous safety training, etc. However, the incidents of injuries continued.

Puzzled, the company hired an external consultant to look into the problem. After rigorous studies, it came out that there was no problem with the company's safety implementation. However, they found a significant area for improvement in the company's culture. At the last moment, the management would put stringent on-time performance limits, resulting in the culture of handling the machines to meet OTPs even when they were running.

Have we never tweaked the SoPs to be 'more comfortable' with the operations?

I would clarify with an example. The first aircraft to take off from the base was for Leh at about 0530 or so. As usual, the airline cries about a shortage of resources like workforce, tools, equipment, etc. (I generally take this with a pinch of salt and hold the Senior Managers responsible for either not managing the resources or not properly putting the deficiencies to the top management).

Anyways, whenever light on duties (though auditors are seldom lightly rostered), I would walk in on the apron (spot checks are unannounced!) to check the departure of this first flight. Usually, pax boarding would be going on; refueling would be on after some technical work, and so on. During such operations, it was mandatory to man the cockpit by an authorized person to order evacuation if needed. That generally meant one flight crew was coming early, which would not happen.

With an auditor standing there, AME would only start refueling with the cockpit being manned, which ultimately would lead to delay, generally to be born by the flight crew (to the discomfort of Ops Dpt) due to late arrival. This would eventually result in conflict between the engineering and Ops. This conflict ultimately resulted in the flight crew being ordered to come before time in case of such requirements. Hence, at times, conflict must occur for things to be correct.

The Need for an Integrated Solution

Generally, the thought leaders in the field of OC and EHS agree on the need for an integrated approach between OC and safety. That gives the idea of handling the OC and safety aspects under a single umbrella for assessing the overall culture while building on safety improvement initiatives through engaging employees in all areas of safety performance. Approaching the culture in holistic and in-depth dimensions can bring significant improvements.

As an organizational change consultant, Dr Simon says, "Safety culture is an anchor strategy for driving trust, which drives employee engagement and psychological safety, which in turn drives organizational performance."

A Simple Integrated Solution Framework

The following simple framework is suggested to implement an integrated approach.

1. The OC limits the effectiveness of safety performance. Hence, the OC must be assessed first to understand its impact on safety implementation.
2. In a multi-site organization, the factors of sub-cultures playing a significant role must be considered.
3. A culture of sparking innovations, solving problems, and spreading best practices must be driven from the top-down approach at all levels and sites.
4. The cultures and safety need to complement each other rather than compete.

To achieve this, education, assessment, planning, implementation, and coaching can be followed.

Educate → Assess → Plan → Implement → Coach

About the Author

Group Captain Sushi, Bhatia (retd) is an M Tech from IIT, Madras, who served the elite Indian Air Force from 1981 to 2007 and has participated in many operations during service. He has been the Lead Auditor for ISO 9001 and is a global Trainer and Assessor for Aerospace Standards AS 9100. He has been an IATA trainer for their international clients. He has served many international airlines and MROs and is a subject matter expert in Aerospace Quality and Safety.

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