International Civil Aviation Organization

ICAO

Thirteenth Meeting of the Air Traffic Management Sub-Group (ATM/SG/13) of APANPIRG

Singapore, 25 – 29 August 2025

Agenda Item 5:   ATM Systems (Modernization, Seamless ATM, CNS, ATFM)

MITIGATION MEASURES TO AVOID CONFUSING CALLSIGNS IN INDIAN AIRSPACE

(Presented by India)

SUMMARY

This working paper highlights the mitigation measures adopted by India in recent years to significantly reduce the occurrence of confusing and similar aircraft callsigns among domestic airlines operating within Indian airspace. Such callsign similarities had previously posed serious safety risks and directly or indirectly contributed to various safety concerns such as excessive RT congestion, incorrect ATC clearances, unauthorized maneuvers, runway incursions, and Airprox incidents.

1.   INTRODUCTION

1.1   Similarities between callsigns, resulting in callsign confusion, can be within the same airline and/or between more than one airline. This type of confusion is a recognized safety risk and has been identified as a contributing factor to serious incidents such as mid-air collisions (MAC) and runway incursions (RI), both of which are Global High-Risk Categories of Occurrence (G-HRC) in ICAO Doc 10004 (GASP Edition 2023–2025).

1.2   The increasing volume of air traffic has resulted in multiple cases of similar-sounding callsigns leading to confusion between controllers and pilots. This has caused RT congestion, miscommunications, incorrect readbacks, Runway incursions and including loss of separation incidents.

1.3   This paper details the causes, real-world incidents, ongoing mitigation measures, and future recommendations to address the persistent risk posed by call sign confusion.

1.4   Strengthening callsign management policies will ensure a more seamless, efficient, and secure global air traffic control environment for all stakeholders.

2.   DISCUSSION

Impact of Callsign Confusion

2.1   The callsign confusions have been on the agenda of numerous safety related meetings at ICAO and many International Organizations. Many of these organizations recommend the use of alpha numeric callsigns as a means to reduce the likelihood of callsign confusions. For example, the Global Action Plan for the Prevention of Runway Incursions first published by Eurocontrol in 2006 and the latest version in 2024 and the Guidance Materials Related to Callsign Similarity published by RASG-

MID in May 2015 recommends the use of alpha numeric callsigns as a means to reduce the likelihood of callsign confusion.

2.2   The additional burden placed on controllers to verify, clarify, and manage conflicting callsigns increases cognitive load, reduces ATM efficiency and safety.

2.3   Increased workload for controllers as they must repeatedly clarify instructions with pilots causing severe RT congestion.

2.4   Potential for incorrect readbacks/hearbacks, leading to unauthorized maneuvers and increased risks.

<u>Causes of Callsign Confusion</u>

2.5   Callsign confusion occurs primarily due to:

a)   use of similar alpha numeric sequences in airline flight numbers viz. ABC103 and ABC203, ABC778 and ABC787);

b)   airlines issuing callsigns that contain identical first or last digits within a short operating period viz. ABC446 and ABC466;

c)   flights of same airlines with identical first two digits operating within short operating period viz. ABC103 and ABC104;

d)   flights of same airlines with identical flight numbers but in different order within short operating period viz. ABC778, ABC787 and ABC877;

e)   suffixing letter 'S','I','O', 'B', 'Z' after numeral should not be used as it creates visual confusion to the controllers on radar screen and/or on the Flight Progress Strip (**'S'** can be confused with **'5', 'I'** can be confused with **'1',** 'O' can be confused with '0', **'B'** can be confused with **'8'** and **'Z'** can be confused with **'2'**).

<u>Case study: ATC Data and Operational Impact in Chennai FIR, India</u>

2.6   In the Chennai FIR (covering Chennai Airport and Chennai Upper Airspace), approximately 2,036 cases of confusing callsigns were reported during the Winter Schedule 2023–2024. This number reduced to 1,389 cases in the Summer Schedule 2024, and further declined to 913 cases in the Winter Schedule 2024–2025, primarily in the domestic sector. These trends highlight the effectiveness of mitigation efforts domestically, while also underlining the urgent need for stricter and targeted measures in the international sector, where callsign confusion continues to persist.

2.7   Data was manually collected, indicating the actual number is much higher.

2.8   These issues lead to increased controller workload such as RTF congestion, incorrect readbacks, and unauthorized maneuvers.

2.9   **Figure 1** depicts the distribution of confusing callsigns of international flights in Chennai Oceanic Airspace during peak traffic periods. **Figure 2, Figure 3, Figure 4 and Figure 5** shows the data of confusing callsigns reported in Chennai FIR.
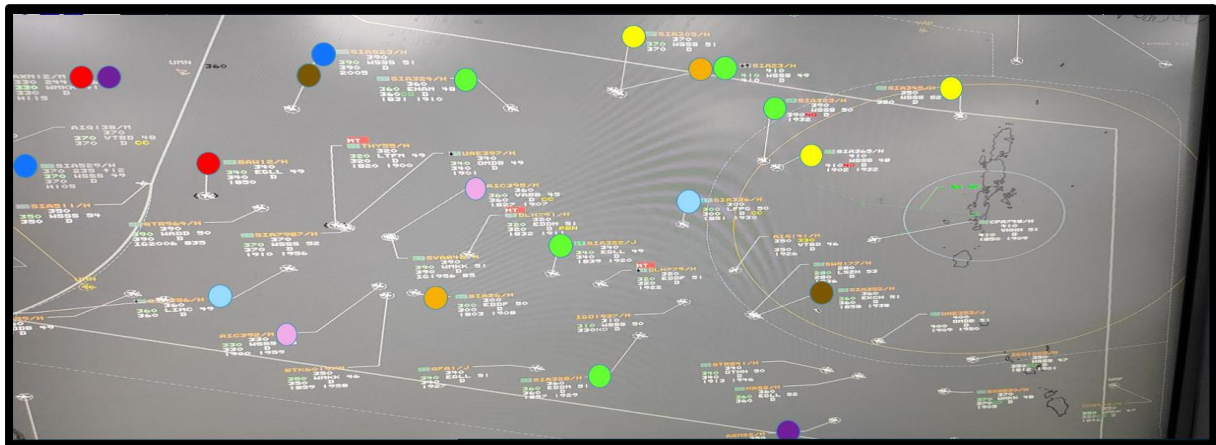
Figure 1: Colours Signify Similar Callsigns Observed by the Flights Operating in International Sector in Chennai Oceanic Airspace During Peak Traffic
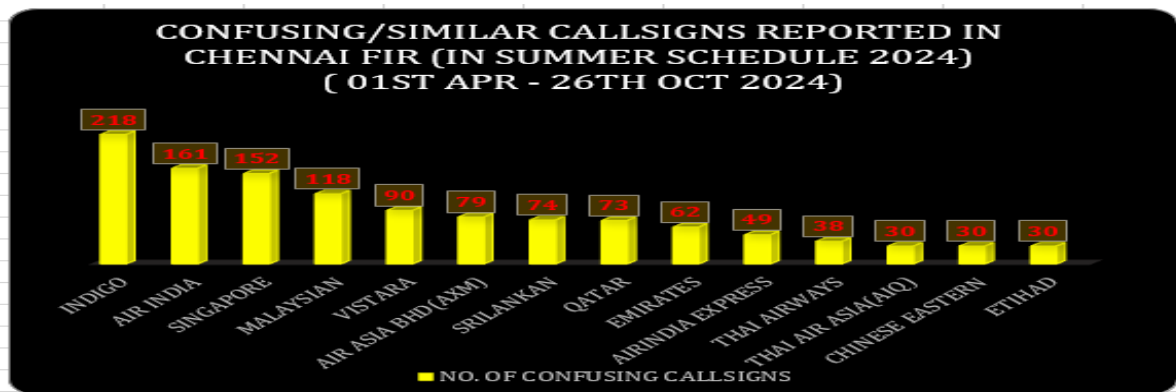

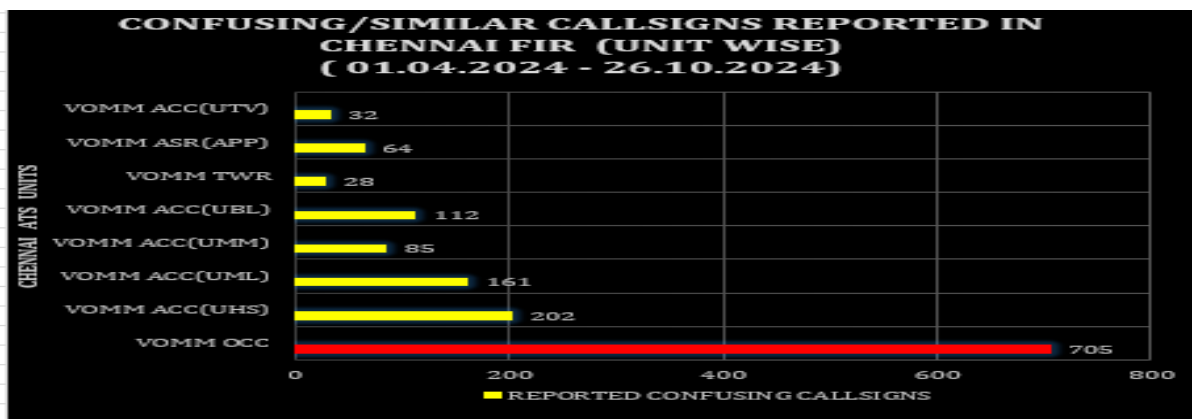**Figure 2: Confusing/Similar Callsigns Reported in Chennai FIR in Summer Schedule 2024**

Figure 3: Confusing/Similar Callsigns Reported in Chennai FIR in Summer Schedule 2024 (ATC Unitwise)

Case	Reporting ANSP or AO	Place of occurrence (Airport,sector etc) Frequency	Date of occurrence (DD/MM/YYYY)	Time (UTC)	Call signs (one line for each)	Departure airport (ICAO 4-letter code)	Arrival airport (ICAO 4-letter code)	Type of aircraft (ICAO type desig)	Aircraft Operator (ICAO 3-letter code)	Route	Type of Occurrence (CSS or CSC)	AO using CSST (YES or NO)	REMARKS
1	AAI	CHENNAI, TWR/APP/ACC, 118.1/127.9/134.25MHz	02.04.2024	1:10	IGO288	VOMM	VEBS	A320	IGO	A465	CSC	NO	CALL SIGN CHANGED TO IGO63P
2	AAI	CHENNAI, TWR/APP/ACC, 118.1/127.9/134.25MHz	02.04.2024	1:20	IGO6288	VOMM	VOBL	A321N	IGO	W117	CSC	NO	
3	AAI	Chennai,APP,127.9MHz	26.04.2024	13:10	AIC537	VIDP	VOMM	B77W	AIC	Q23	CSS	NO	
4	AAI	Chennai,APP,127.9MHz	26.04.2024	13:10	AIC587	VOMM	VOHS	A359	AIC	W20	CSS	NO	
5	AAI	Chennai,OCC,126.15MHz	02.04.2024	18:40	SIA323	EHAM	WSSS	A359	SIA	L510	CSS	NO	
6	AAI	Chennai,OCC,126.15MHz	02.04.2024	18:40	SIA324	WSSS	EHAM	A359	SIA	P574	CSS	NO	
7	AAI	Chennai,OCC,126.15MHz	02.04.2024	18:40	SIA327	EDDM	WSSS	A359	SIA	L510	CSS	NO	
8	AAI	Chennai,OCC,126.15MHz	02.04.2024	18:40	SIA328	WSSS	EDDM	A359	SIA	N571	CSS	NO	
9	AAI	Chennai,OCC,126.15MHz	02.04.2024	18:40	SIA23	KJEK	WSSS	A359	SIA	P628	CSS	NO	
10	AAI	Chennai,OCC,126.15MHz	02.04.2024	18:40	SIA26	WSSS	EDDF	B77W	SIA	N571	CSS	NO	
11	AAI	Chennai,OCC,126.15MHz	02.04.2024	18:40	SIA351	EKCH	WSSS	A359	SIA	N877	CSS	NO	
12	AAI	Chennai,OCC,126.15MHz	02.04.2024	18:40	SIA352	WSSS	EKCH	A359	SIA	N571	CSS	NO	
13	AAI	Chennai,OCC,126.15MHz	02.04.2024	18:40	SIA523	VOHS	WSSS	A359	SIA	N877	CSS	NO	
14	AAI	Chennai,OCC,126.15MHz	02.04.2024	18:40	SIA529	VOMM	WSSS	B78X	SIA	N571	CSS	NO	
15	AAI	Chennai,OCC,126.15MHz	02.04.2024	18:40	SIA336	WSSS	LFPG	B77W	SIA	P574	CSS	NO	

Figure 4: List of Confusing Callsigns Observed in Various Units and That is being Reported by Chennai ATCOs as per ICAO Format

Figure 5: Alpha Numeric Callsigns Capable Airports in the Year 2024 as Reported by Few Airlines

Mitigation Initiatives by Indian ANSP

2.10   Sensitizing all controllers and various stakeholders such as airlines, slot allocation teams, continuously on the safety risks caused by aircraft operating with same/similar/confusing callsigns.

2.11   Encouraging controllers to report the confusing callsign issues on standard format in line with the ICAO MIDANPIRG ATM SG/3 WP/28 (Call Sign Confusion Initiative presented by IATA in Cairo, Egypt from 22 – 25 May, 2017) (refer **Figure 4**).

2.12   Enabled visual alerts for same callsigns to controllers in all the Chennai ATM workstations to enhance situational awareness and to prevent incidents.

2.13   Exploring use of Artificial Intelligence (AI) and Machine Learning (ML) to develop tools for automatically identifying confusing/similar callsigns before and after approval of slots.

2.14   Upon continuous reporting and follow up, few airlines in India have implemented alphanumeric callsigns for their domestic operations and some have changed those to non-conflicting callsigns, significantly reducing the conflicts in domestic flights.

Way Forward to Mitigate Callsign Confusion

2.15   The meeting may consider requesting ANSPs in the Asia/Pacific Region to:

a)   explore the possibility of upgrading ATM automation systems to enable the handling and display of alphanumeric callsigns in all relevant operational positions;

b)   promote regional and global coordination initiatives to harmonize the recognition and use of alphanumeric callsigns, especially for cross-border traffic;

c)   explore the possibility of using AI/ML-based automated tools to proactively detect and resolve similar/confusing callsigns before flight plan approvals and during tactical operations;

d)   implement reporting mechanisms for callsign confusion incidents; and

e)   conduct regular training and awareness programs for controllers, flow management personnel, and relevant CNS/ATM/Operations (Slot Allocation) teams on the safety criticalities and mitigation of callsign confusion.

Recommendations to Airlines, IATA, CANSO, ACI etc

2.16   The meeting may consider requesting all airlines, IATA, CANSO, ACI or the relevant international bodies to:

a)   adopt easy-to-pronounce alphanumeric callsigns for both domestic and international operations, designed to reduce RT congestion and eliminate phonetic ambiguity;

b)   use more monosyllable alphabets and numbers (G, M, 1, 2, 3, 4, 5, 6, 8) and in rare cases to use bi-syllable alphabets and numbers (A, C, D, E, F, H, K, L, P, Q, T, V, W, X, Y, Z, 0, 7, 9) while using alphanumeric callsigns;

c)   use internal flight planning and scheduling systems integrated with AI/ML-based tools to pre-check and avoid callsign conflicts with other carriers operating on the same or adjacent routes/time windows;

d)   work in coordination with ANSPs and regulatory authorities to review and redesign callsign assignments for fleets or codeshares where similarity issues have been repeatedly identified; and

e)   provide training and sensitization programs for flight crews, flight dispatchers, Slot coordination team on best practices related to callsign clarity, accurate readbacks, and prompt reporting of any callsign confusion incidents.

3.   ACTION BY THE MEETING

3.1   The meeting is invited to:

a)   note the information contained in this paper;

b)   encourage States/Administrations and stakeholders to adopt appropriate mitigation measures;

c)   encourage States/Administrations which have implemented alphanumeric callsign to share best practices and lessons learnt;

d)   encourage stakeholders to to identify and overcome any barriers for the implementation of alphanumeric callsigns; and

e)   discuss any relevant matters as appropriate.

— END —