CAA
هيئة الطيران المدني
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الهيئة العامة للطيران المدني
GENERAL CIVIL AVIATION AUTHORITY

United Arab Emirates

USE OF MODE S CONSPICUITY CODE

Oct 2024

Federal Authority | هيئة إتحادية

Current Challenges

The growing number of flights has strained the available code groups, making it challenging to assign unique SSR codes while adhering to the agreed-upon two-hour retention time.

Concerns about potential code conflicts and the need for efficient methods of code allocation to maintain the integrity and safety of air traffic management.

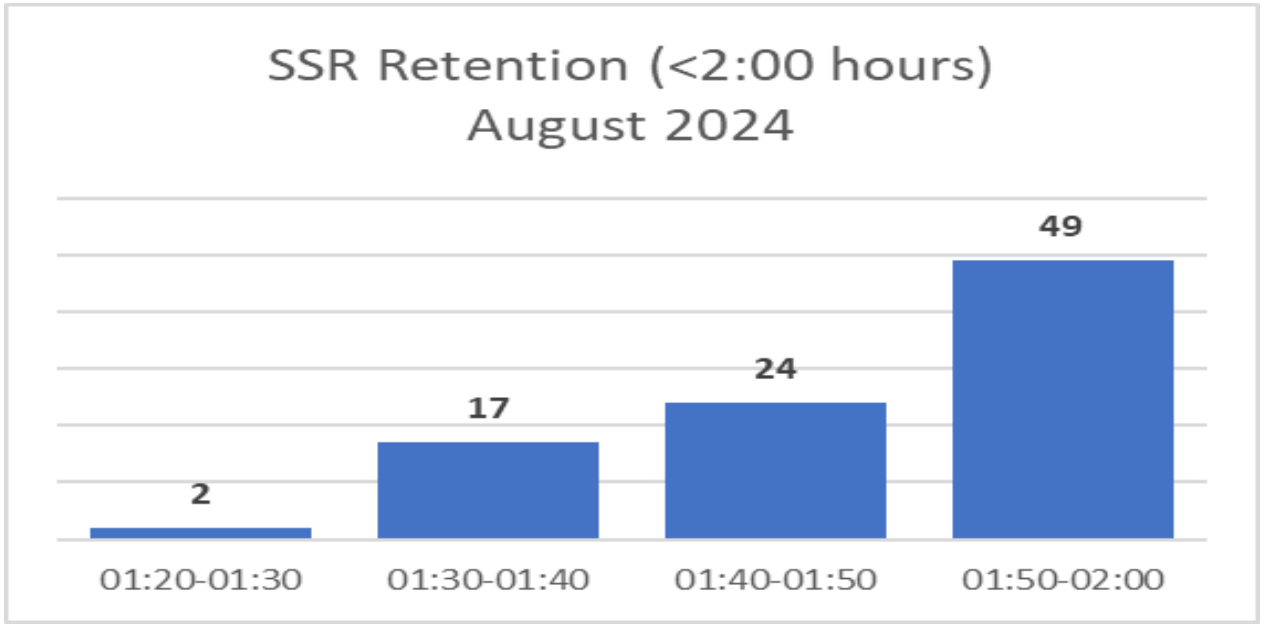
Increasing complexity of air traffic management, driven by the flow in international flights in the MID region, necessitates a more robust approach to SSR code allocation

Availability of SSR codes is constrained by transponder technology, offering a total of 4,096 technically available codes

Use of SSR Codes for Transit Flights

Middle East SSR Code Management Plan agreed that transit SSR codes **shall not be reused with 2 hours**

Due to increase number of traffic, Below number of SSR Retention that was less that 2 Hours in Aug 2024



INTRODUCTION to Mode S Conspicuity Code

Unique Aircraft Identification
Mode S Conspicuity Code assigns a unique 24-bit address to each aircraft, enabling precise identification and tracking.

Enhanced Data Transmission
The unique identification and data exchange capabilities of Mode S enable seamless communication with ATC.

Improved Surveillance
It allows ATCOs to recognize and track aircraft more effectively.

Mode S Conspicuity Code

- Ensure that each aircraft is distinctly identified without the risk of code duplication.
- It is beneficial in high-density traffic areas, where the potential for SSR code conflicts is elevated.
- Simplifying the process of code allocation for transit flights.
- Standard and non-discrete SSR codes telling the ATM systems NOT to make use of SSR code to identify the aircraft.
- In line with the EUR and APAC region.
- MID SSR CMP reserves the code A1000 as conspicuity code.

Mode S Conspicuity Code

Proves more advantageous when assigned to transit flights that cross AOR boundaries. In such cases, all involved ATC units utilize Mode S downlinked data for flight identification and seamless flight plan coordination.

The adoption of conspicuity codes aligns with the broader goals of modernizing global air navigation systems, as outlined in ICAO's Global Air Navigation Plan (GANP).

It does not only address current challenges but also pave the way for future enhancements in surveillance and air traffic control.

Mode S surveillance sensors in Mid Region States as of August 2024

According to the Mode S Interrogator Code Allocation (MICA) data a total of 140 Mode S radars are implemented for another 7 Mode S radars requests for code allocations have been issued.

Mode S surveillance in the MID region is widely established.

State	Implemented	Issued	Total
Bahrain	3	0	3
Egypt	29	0	29
Iran	0	3	3
Iraq	3	1	4
Jordan	7	0	7
Kuwait	1	0	1
Lebanon	1	0	1
Oman	11	2	13
Qatar	4	0	4
Saudi Arabia	73	0	73
United Arab Emirates	8	1	9

Mode S Conspicuity Code

Many states in the Mid Region continue to rely on Mode A/C information.

This reliance is due to the fact that the benefits of conspicuity code are fully realized only when an aircraft operates under Mode S over a significant and continuous portion of its flight.

For transit flights, this necessitates those adjacent states support Mode S across their borders, facilitating the coordination of flights with the agreed-upon conspicuity code.

Use of a conspicuity code by a state, or coordinated across multiple states, requires
- a full Mode S radar environment,
- aircraft being Mode S capable,
- Compatible ATM system capabilities.

If an ATSU is not able to support a continuous control of a flight with the conspicuity code, it is required to revert back to allocate individual SSR codes for the transit flights neglecting the purpose of using Mode S.

Considerations to use Mode S and aircraft identification

Only reasonable if flights can be operated with conspicuity for a significant portion of the route with Mode S identification.

Hybrid operation may be useful in the beginning

Mode S aircrafts squawk A1000

Requires ATM automation systems to support identification

ACTION BY THE MEETING

- Take note of the information contained in this paper, particular the challenges to allocate SSR codes for transit flights with the required retention times to the increasing number of flights;

- Recognize that use of the conspicuity code A1000 for transit flights and Mode S aircraft identification and coupling with flight plans is a viable and proven solution to overcome this challenge;

- Recognize that the use of a conspicuity code for transit flight is best addressed in a coordinated manner of states to have a joined planning to assure operational and technical readiness of all stakeholders:

- Encourage the States interested to use conspicuity code for transit flights and Mode S aircraft identification and coupling with flight plans to initiate joint discussions to update the bilateral agreements for the implementation.

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Thank You.