



INTERNATIONAL CIVIL AVIATION ORGANIZATION

SURVEILLANCE/MODE S INTERROGATOR CODE ALLOCATION (MICA) WORKSHOP

(Cairo, Egypt, 26 – 28 February 2019)

SUMMARY OF DISCUSSIONS

1. PLACE AND DURATION

1.1 The Surveillance/Mode S Interrogator Code Allocation (MICA) was held at the ICAO MID Regional Office, Cairo, Egypt, 26-28 February 2019.

2. ATTENDANCE

2.1 The meeting was attended by twenty five (25) participants from six (6) States (Egypt, Iran, Iraq, Qatar and Sudan) and two (2) Organizations (IFATCA and Eurocontrol). The Workshop supported by EUROCONTROL and Aireon participated via Webex. The list of participants is at **Attachment A**.

3. WORKSHOP OBJECTIVES

3.1 The objectives of the Workshop were to:

- 1) provide an overview of the Mode S principle and operation, the SSR Radio frequency, Avionic Monitoring, and the new Surveillance Standards;
- 2) provide the MICA Operators in the MID Region with necessary information to implement MICA processes efficiently; and
- 3) review and update the Draft MID Region Surveillance Plan.

4. DISCUSSIONS

4.1 The Workshop:

- was apprised of the Mode S principles; lockout, Radar coverage, clusters, IC codes, Elementary and enhanced Surveillance.
- noted MICA process and cycle, EUROCONTROL MICA website was presented.
- reviewed and updated MICA focal points in the MID Region.
- was apprised of the II and SI codes use, operation and allocation.
- noted IC Conflict causes and Management process.
- was apprised of Mode S Radar programming to reduce their contribution to 1030/1090MHz RF band usage.

- was apprised of the radar systems use the shared RF band 1030/1090, examples in Europe and simulation of future use.
- highlighted the impact of the Small Unmanned Aircraft System (sUAS) equipped ADS-B operation on Aircraft detection.
- was apprised of the space based ADS-B technology; constellation, coverage and validation algorithm.
- noted that EU mandates ADS-B carriage version 2 for IFR flight and aircraft more than 5700kg from 2020.

5. CONCLUSIONS

- No IC allocation needed for mobile Mode S radars and WAM/MLAT (II Code 0).
- In the ICAO MID Region, II codes and matching SI codes are still not allocated to Mode S radar with overlapping coverage.
- EMS Coverage maps allocated by the MICA Cell when supported by Mode S radar and reported in the IC application. Otherwise, range per sector is provided.
- When IC conflict is detected, the Focal Point has to provide the necessary assistance and advice to achieve an early resolution of the IC conflict.
- Radar detection of outbound traffic and not inbound, would be a symptom of IC Code conflict (delayed acquisition of incoming aircraft by Mode S radar).
- Target disappearance could be resulted from transponder over interrogations, so it will be unable to reply to other interrogations. As too many interrogations may prevent the transponder to reply to some of them, and has an impact on surveillance systems.
- The output power and density of sUAS equipped ADS-B could impact the detection range of Aircraft.
- The detection range of aircraft decreases when the ADS-B squitter rate and/or number of aircrafts in sky increase.
- The importance to verify that transponders are not subject to excessive rate of interrogations (below ICAO minimum reply rate capability (50 reply/s)) was highlighted.
- ADS-B version 2 provides good position indicators.
- Space-based ADS-B provides more than a single source ADS-B (ground based ADS-B). With the redundancy of the satellite coverage the same message is received by more than 1 satellite, that means that space based ADS-B is not only providing to the ANSP the ADS-B message, but it is able also to validate the position of that message, independently from GPS or transponder quality. To do the same with ground stations, a complete WAM system will be required, with at least 3 sensors looking at the same target.
- single source ADS-B means that an ADS-B coverage coming from a single ground sensor. In this case, if a transponder has a bad quality, the ANSP has no way to validate the position.
- Space based ADS-B does not require any modification on board of an ADS-B equipped aircraft. it is capable to receive ADS-B messages from all ADS-B transponder, so v.0, v.1, v.2.
- The Hardware needed by ANSP is the Service Delivery Point, a simple redundant router and server. As for data distribution, dual MPLS line can be used to connect SDP to the Space based ADS-B domain. If MPLS will not be available, a dedicated solution has to be investigated

6. RECOMMENDATIONS

- States shall request coordinated IC code(s) and coverage map(s) (Surveillance and lockout) before start of operation, preferably one year in advance.
- States to plan carefully using active MLAT in order not to generate excess 1030/1090MHz FRUIT; and not to over occupy the Transponder (due to selective interrogations).
- States to monitor, if possible, the transmission on 1030/1090MHz to make sure that Aircraft are not over-interrogated (ICAO annex 10, Vol VI, section 3.1.2.10.3.7.3 & section 3.1.1.7.9.1)
- States to program radar to extract needed BDS register Data and not to extract unused ones.
- For the safety of the air traffic surveillance system, the coverage of two Mode S radars using the same IC shall not overlap.
- Target disappearance is a safety related issue, fall-back procedure should be in place including lockout override.
- ICAO MID to coordinate with IATA to get statistics on the percentage of SI equipped aircraft in the MID Region.
- Regulators and Radar Operators are encouraged to register to MICA website.
- ICAO MID to consider addressing the impact of vehicles equipped ADS-B (ex. sUAS, gladder, airports vehicles, etc.) on 1090MHz RF environment in future relevant Workshops.
- CNS SG/9 to consider requiring that Mode S Radars support the use of II/SI code operation.
- MID Region to consider allocating II code and matching SI for Military.

LIST OF PARTICIPANTS

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