**RTCA Special Committee 186, Working Group 5**

**ADS-B UAT MOPS**

**Meeting #25**

# Response to AI24-04: Event-Driven Transmission Sequences
**Revision 1**

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SUMMARY

This Working Paper is a follow-up to Action Item 24-04. It proposes changes to the UAT MOPS to provide for an "event-driven" Payload Type transmission sequence in response to changes to the Flight Plan ID (Mode A code) and/or the Emergency/Priority status.

To provide for an "event-driven" Payload Type transmission sequence in response to changes to the Flight Plan ID (Mode A code) and/or the Emergency/Priority status the following section should be added to DO-282B:

**2.2.6.1.2.1 Event-Driven ADS-B Payload Allocation**

Immediately following any modification of the Fight Plan ID (see §2.2.4.5.4.2), the Payload Selection sequences specified in §2.2.6.1.2 **shall** be modified for a period of 6 seconds. For 6 consecutive seconds all transmissions from all Equipment Classes **shall** be Payload Type Codes 1 or 3, as appropriate for the equipment class. During this interval, the Flight Plan ID **shall** be transmitted in every message and the CSID Flag (see §2.2.4.5.4.15) will be set to the value ZERO (0).

Immediately following any modification of the Emergency/Priority Status Selection Input (see §2.2.4.5.4.4), the Payload Selection sequences specified in §2.2.6.1.2 **shall** be modified for a period of 6 seconds. For 6 consecutive seconds all transmissions from all Equipment Classes **shall** be Payload Type Code 1 or 3, as appropriate for the equipment class.

After the transmission of 6 event-driven messages is completed, the transmission sequence specified in §2.2.6.1.2 **shall** be resumed unless one or more triggering events occurred during the 6 seconds. In that case, the transmission of only Payload Type 1 or 3, as appropriate for the equipment class, **shall** continue until no triggering event has occurred within the most recent 6 seconds.

> ***Note:*** *The revised sequence provides for the transmission of a Mode Status Element containing the Flight Plan ID in every ADS-B message whenever the Flight ID is changed. The Mode Status Element also contains the EMERGENCY/PRIORITY STATUS field. Transmission of the MS Element at a high rate allows recipients to rapidly update the Flight Plan ID and/or Emergency/Priority Status in the event of a change.*

For testing, the following should be added:

**2.4.6.1.2.1 Verification of Event-Driven ADS-B Payload Allocation (§2.2.6.1.2.1)**

Appropriate test procedures to validate the requirements in §2.2.6.1.2.1 are included in §2.4.6.1.3.

Change the last sentence of the "Purpose/Introduction" subsection of §2.4.6.1.3 to read "…requirements (including transmit antenna selection) of §2.2.6.1.2, §2.2.6.1.2.1 and §2.2.6.1.3."

Also, the following steps should be added to §2.4.6.1.3

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Step 6: Record the sequence of transmitted messages from the UUT after a change to the Flight ID.

For units which can support such a change, change the Flight ID while the UUT is transmitting its normal sequence shown in Table 2-96 and allow it to continue to transmit for an additional 16 seconds. Test receivers will record the Payload Types for each received message on its antenna port.

Step 7: Record the sequence of transmitted messages from the UUT after a change to the Emergency/Priority Status.

For units which can support such a change, change the Emergency/Priority Status while the UUT is transmitting its normal sequence shown in Table 2-96 and allow it to continue to transmit for an additional 16 seconds. Test receivers will record the Payload Types for each received message on its antenna port.

Step 8: Record the sequence of transmitted messages from the UUT after a change to both the Flight ID and Emergency/Priority Status within 6 seconds.

For units which can support such a change, change the Emergency/Priority Status while the UUT is transmitting its normal sequence shown in Table 2-96. Prior to 6 seconds after changing the Emergency/Priority Status change the Flight ID and allow the UUT to continue to transmit for an additional 16 seconds. Test receivers will record the Payload Types for each received message on its antenna port.

Step 9: Analyze the messages recorded in steps 6, 7 and 8.

For each receiver, determine that the proper sequence of Payload Type has been recorded as per §2.2.6.1.2.1 and that the Pay Type sequence returns to that shown in Table 2-96 TBD seconds after the final change in Emergency/Priority Status or Flight ID. Verify that the Fight ID is transmitted in every message as required,

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It seems that, based on UAT-WP-24-15, the value of TBD ought to be 8, since that is the largest time period mentioned in the cited working paper. That Working Paper also determined that a change in $NAC_P$ was *not* a triggering event. HOWEVER, during discussion in Meeting #25, it was agreed that the TBD value would be 6 seconds.

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**Recommendation:** It is recommended that WG-5 consider adding this new feature to DO-282B. In order to do so, the value TBD needs to be agreed upon. During Meeting #25, the value of TBD was agreed to be 6 seconds.