**Summary of Meeting #25 of RTCA SC-186 Working Group 5**
**held at RTCA in Washington DC and as a Teleconference and WebEx Session for the Maintenance of the UAT MOPS**
**on 14 – 16 July 2009**
**http://adsb.tc.faa.gov/WG5.htm**

The meeting was called to order by Working Group 5 Co-Chair Richard Jennings at about 9:00am EDT on 14 July 2009 at the facilities of RTCA in Washington DC. Rich welcomed all attendees. The participants during all, or part of Meeting #25 at RTCA and the WebEx session included:

| | | |
|---|---|---|
| Dr. Larry Bachman, JHU-APL | Stan Jones, Mitre / CAASD | Stuart Searight, FAA ATO-P |
| Chip Bulger, FAA AIR-130 | Dr. George Ligler, PMEI – FAA SBS P.O. | Bernald Smith, SSA / FAI |
| Gary Furr, Engility Corp, FAA ATO-P | Chris Moody, Mitre / CAASD | Ed Valovage, Sensis |
| Michael Garcia, ITT Corp | Tom Mosher, Garmin AT | Don Walker, Honeywell |
| Richard Jennings, FAA AIR-130 | Tom Pagano, FAA ATO-P | Warren Wilson, Mitre |

1. Richard Jennings began Meeting #25 with **Agenda Item #1** by welcoming all participants to RTCA, with the Telephone bridge line provided by Mitre CAASD and the WebEx Session provided by RTCA. George Ligler was unable to be at the Meeting on Tuesday, 14 July because of another commitment.

2. After Rich concluded his welcome, the Meeting turned its attention to **Agenda Item #2** for a review of the proposed Agenda for this Meeting, which was distributed for this Meeting under Working Paper UAT-WP25-01. Gary noted that all revisions of Working Papers would be posted to the WG-5 web page as soon as possible after their revision. The Agenda was reviewed in detail because of the specific requirements related to presentation timing and the availability of certain Working Group members. Several Working Papers were scheduled to be presented at specific times. Larry Bachman asked a question regarding Agenda Item #6f related to the discussion on the ADS-B MASPS as to whether or not there is a scheduled update to DO-242A. Stuart Searight answered that there was no specific scheduled event, however as has been going on since the first MOPS meetings, WG-6 has been involved with collecting the proposed changes and will continue to produce Issue Papers that can be referenced when the time comes to update DO-242A. Gary concluded this Agenda Item by indicating that any revised Agenda will be posted on the web site for Meeting #25 as UAT-WP25-01R1.

3. Next, under **Agenda Item #3**, the Meeting reviewed Working Paper UAT-WP25-02 for the review and approval of the Minutes of Meeting #24, which was held on 3 - 4 June 2009 at RTCA and as a Teleconference and WebEx session. No discussion was held regarding the Minutes of Meeting #24 and therefore, the Minutes of Meeting #24 were approved as published in Working Paper UAT-WP25-02.

4. Under **Agenda Item #4a**, the Meeting then began a detailed review of Working Paper UAT-WP25-03 as Gary Furr began the review of all of the current status of the proposed changes that should be discussed and agreed upon for the proposed DO-282B. Gary pointed out that UAT-WP25-03 represents the latest update to the proposed set of changes that were reviewed, discussed and agreed upon by RTCA SC-186 WG-3 and EUROCAE WG-51, SG-1 during their effort to update and harmonize the 1090ES MOPS during their latest meeting in June at EUROCAE in Paris. The list of proposed changes that appears in UAT-WP25-03 is a subset of the original total 1090ES list and represents those proposed changes that potentially affect both the ADS-B MASPS and the UAT MOPS. This Working Paper is continuously updated during and after the WG-5 meetings to reflect the latest status of each change.

   4.1 For Change Matrix Item #9, regarding the proposal to change the definition of the CDTI Installed/Operational bit to an ADS-B IN capability parameter, there was discussion on how the new ADS-B IN parameters will be used. Tom Mosher wants to ensure that when this is implemented, a note is inserted that indicates that this bit is being used by the Ground Stations to determine whether or not to transmit on this UAT Link to this specific participant.

   4.2 For Change Matrix Item #12, there was discussion as to how the UAT MOPS will deal with the Wake Vortex draft Appendix. George Ligler indicated that it is going to be difficult for the subgroup working on this task to complete what they need to for the 1090ES MOPS. Therefore, the Meeting agreed that there would be no detailed specification of the proposed bit structure for UAT Messages for this UAT draft Appendix. We will simply take the draft Appendix that will be provided for DO-260B and basically change "1090ES" to UAT, and may also change some other basic language, and publish the draft Appendix in DO-282B.

   4.3 For Change Matrix Item #15, there was discussion as to the need to have further dialog because George came back to WG-3 with an input from SC-159, indicating that the NIC and NAC need to be zeroed out when Bit 11 is set. Tom Pagano indicates that at least one manufacturer in the WG-3 meeting in Paris has disagreed with the statement that both the NIC and NAC values should be zeroed out if the bit 11 is set. George and Tom agreed that they would call the manufacturer to discuss this. This call occurred at the end of the WG-5 meeting and George explained the reasoning behind the zeroing of both of the parameters. The manufacturer agreed that if the draft Note that Tom will write indicates that both the NIC and NAC should be zeroed, then he will have no further objections. This will be discussed again during the WG-3 meeting 21 – 24 July at RTCA.

   4.4 For Change Matrix Item #26 there was further discussion regarding the fact that the UAT MOPS specifies more than the 1090ES MOPS does and Chris Moody accepted **Action Item 25-01** to propose text deletion and a new Note for DO-282B for guidance. Later in the meeting, the text was actually deleted and Gary and Tom agreed to rewite the test procedures to account for the change.

   4.5 For Change Item #27 there was further discussion on the need for the "Single Antenna" flag. Action Item 25-02 was assigned to Rich and Tom to produce text for a Note.

5. Next, under **Agenda Item #5**, the Meeting began the review of Working Papers that have been submitted as the result of Open Action Items, which were initially accepted during previous Meetings. Working Papers in Agenda Item #5 were taken in no particular order and were interleaved with Working Papers in Agenda Item #6. The presentation of a given Working Paper was dependent on the availability of certain Meeting Members. The summaries below simply represent the summaries at the time of presentation.

   5.1 The first Working Paper to be reviewed was UAT-WP25-04 under Agenda Item #5a as presented by Warren Wilson in response to Action Item 24-04, regarding the implementation of the increase in rate of transmission of the Mode A Code (Flight Plan ID), which in DO-282A was alternately transmitted every 4 seconds in the Mode Status Element. Warren indicates that based on the analysis in UAT-WP24-15, the period of increased broadcast rate should be 8 seconds, and the Mode Status Payload Type Code should be transmitted every one second for 8 seconds. It was discussed that the Payload Type Code of 3 also contained the Mode Status Element and the Working Paper was edited to create UAT-WP25-04R1 to reflect the required changes. It was also agreed that the TBD value in the Working Paper should be six (6) seconds based on the requirements of the FAA SBS Ground Stations and the fact that the period of time of the increase should be as small as possible so as not to interfere with other transmissions and receptions. Gary Furr agreed to implement the suggested changes contained in UAT-WP25-04R1 into the draft of DO-282B.

   5.2 Chris Moody presented Working Paper UAT-WP25-08 under Agenda Item #5c as an issue related to the test procedure for implementing the previous changes related to the CSID Logic in response to Action Item 24-06. After review and discussion, the Working Paper was accepted and Gary Furr agreed to implement the suggested changes contained in UAT-WP25-08 into the draft of DO-282B.

   5.3 Larry Bachman presented Working Paper UAT-WP25-09 under Agenda Item #5d as an issue related to proposed changes in Appendix K for performance of the new equipment class for A1S, in response to Action Item 23-06. There was concern voiced by the Meeting as to the origin of the requirement for the 2 seconds. Minor edits were made to the Working Paper during discussion to produce UAT-WP25-09R1. **Action Item 25-03** was accepted by Larry Bachman to enhance the Working Paper by adding an expanded introduction and specifying where in Appendix K to place the information.

   5.4 Tom Mosher presented Working Paper UAT-WP25-10 under Agenda Item #5e as an issue related to the redefinition of the Target State Element in response to Action Item 24-03. Tom took the proposed revision of the 1090ES Target State and Status Message that was specified in Working Paper 1090-WP28-05 and indicated the parameters that would be required in the UAT Target State Element. The Meeting approved the Working Paper and Tom Mosher agreed to accept A**ction Item 25-04** to write the specific requirements and test procedures for DO-282B.

5.5 Warren Wilson presented Working Paper UAT-WP25-05 under Agenda Item #5b as an issue related to potentially up-linking some sort of feedback information to the Ground Stations in response to Action Item 24-08. Larry Bachman asked why the proposed set of values only went up to 31, and after discussion, it was agreed that Warren would mark up a hardcopy of the Working Paper, and then the Working Paper would be edited to produce UAT-WP25-05R1. This markup happened during the Meeting and markups with the proposed Table of values was then agreed upon by the Meeting. Tom Pagano also asked a question on behalf of the FAA Technical Center to inquire as to whether or not it would be possible to also provide some information on TIS-B Messages received. It was agreed by the Meeting that this was not feasible. *After the end of the Meeting, Tom Mosher and Warren Wilson consulted and came up with some improvements in the requirements text to improve understanding and the Working Paper was edited post-Meeting to produce UAT-WP25-05R2.* Gary Furr agreed to implement the suggested changes contained in UAT-WP25-05R2 into the draft of DO-282B.

5.6 Larry Bachman presented Working Paper UAT-WP25-12 under Agenda Item #5f as an issue related to taking pieces out of the STP MOPS to retain in each of the ADS-B Link MOPS in response to Action Item 24-01. Larry accepted **Action Item 25-07** to draft requirements and test procedure text for both MOPS on the horizontal source selection and propose a location in both documents.

6 Next, under **Agenda Item #6**, the Meeting discussed the additional Working Papers that represent additional issues related to the potential changes to DO-282A. Working Papers in Agenda Item #6 were taken in no particular order and were interleaved with Working Papers in Agenda Item #5. The summaries below simply represent the summaries at the time of presentation.

6.1 Chris Moody presented Working Paper UAT-WP25-06 under Agenda Item #6a as an issue related to more changes for the Address Qualifier. After brief discussion, the proposal of the Working Paper was agreed to, and Gary Furr agreed to implement the suggested changes into the draft of DO-282B.

6.2 Chris Moody presented Working Paper UAT-WP25-07 under Agenda Item #6b as an issue related to the potential changing of the Mode Status Element. There was discussion as to whether we would reconsider the use of the $NIC_{BARO}$ bit. It was agreed that the Working Group has previously determined that even though the $NIC_{BARO}$ parameter has little value, it would be retained in DO-282B. It was agreed that the Working Group would recommend a Note in DO-282B to the effect that in future versions of the MOPS, the $NIC_{BARO}$ would likely be deleted. Chris Moody accepted **Action Item 25-06** to take the agreed recommendations of UAT-WP25-07 and specify the details of the requirements and test procedures for DO-282B.

6.3 Stuart Searight began a discussion on how to handle the updating of the Appendix on MASPS compliance under Agenda Item #6f. After discussion, it was agreed that Stuart Searight and Dean Miller will accept **Action Item 25-09** to write up a couple sets of text to go in each MOPS to replace the current MASPS Compliance Appendix. This replacement text will indicate that in DO-260A and DO-282A the MASPS Compliance

Appendix was used to compare the MASPS requirements with the corresponding MOPS requirements to ensure that all MASPS requirements had been properly met. Going forward, since a planned update of DO-242A to DO-242B has not yet been completed, it was agreed that both Link MOPS documents would contain a one-page explanation to be written by Stuart and Dean describing that the MASPS Compliance Matrix would be updated at a future time.

6.4 Don Walker presented Working Paper 1090-WP28-24R1 under Agenda Item #6e as an issue related to adding a parameter to the ADS-B link to provide vertical metrics. Don discussed briefly the reasons behind the need for the proposal for a vertical metric and briefly reviewed the issues in the Working Paper that refer to the ASAS MOPS needs for vertical metrics. The UAT Meeting agreed with the specification of the new vertical metrics parameter and Chris Moody agreed to include it in the Mode Status Element associated with **Action Item 25-06**.

6.5 It was agreed by the Meeting that it would not be necessary to cover Working Paper 1090-WP28-22R1 on the topic of ADS-B Fail Indication because the UAT MOPS already covered this and since UAT is a separate box from the transponder, the issues in the 1090ES Working Paper did not apply to UAT.

6.6 Chip Bulger presented Working Paper 1090-WP28-18R1 under Agenda Item #6c as a discussion of the issue related to redefining the SIL parameter, which was discussed during the WG-3/SG-1 meeting in Paris in June. Chip explained the reasons behind the need to make the changes in the SIL parameter and discussed the agreements that were reached during the Paris meeting in the resolution for defining the Source Integrity Level (SIL), the SIL Supplement, and the System Design Assurance (SDA) parameter. There was considerable discussion and some minor editing of the text already drafted for the draft of DO-260B. Chris Moody agreed to include the new requirements for the SIL parameter pieces in the Mode Status Element associated with **Action Item 25-06**.

6.7 Tom Pagano brought up the issue concerning changes required in TIS-B by the update of the MOPS to Version 2. Tom pointed out that 1090ES currently has no version number for TIS-B so if TIS-B on 1090ES is updated to Version 2, problems would result for current avionics. Updating TIS-B to Version 2 on UAT has potential impact on current UAT receivers and since it is not clear there is any need or advantage to updating TIS-B to Version 2, this will need to be considered by the FAA SBS Program Office. However, since UAT can provide the version number in TIS-B messages, UAT does not need to modify the MOPS for TIS-B.

7. Under **Agenda Item #7**, the Meeting briefly discussed the dates, times and length of the future meetings of RTCA SC-186 WG-5. The Working Group agreed that the currently planned future meetings in order to meet our schedule would remain to be the following:

| Meeting | Dates/Time | Meeting Location |
|---|---|---|
| #26 | 11 – 13 August 2009<br>9:00am – 5:00pm EDT | RTCA Headquarters, Washington DC |
| | 31 August 2009 | Release draft document to SC-186 for FRAC |
| #27 | Week of 5 October 2009<br>Dates & Times **TBD** | RTCA Headquarters, Washington DC with<br>RTCA SC-186 Plenary on 9 October 2009 |

8. The following is a summary of all of the Open Action Items from Meeting #23, and #24 and Action Items accepted during Meeting #25.

| Action Number | Open Action Item Description | Assigned to | Status |
|---|---|---|---|
| 23-11 | Provide prior to the July WG-5 meeting a proposed resolution for the Fail/Warn issue | Tom Pagano<br>Rich Jennings | Due < 6 August |
| 24-02 | Develop a brief discussion for UAT specific appendix for the proposed Wake Vortex data. | George Ligler | Due < 6 August |
| 24-07 | Review WP24-16 and propose specific text and location to go into the new Appendix on $NAC_V$. Additionally draft a note to go under Table 2-46 to reference the new Appendix. | George Ligler<br>Stan Jones | Due < 6 August |
| 25-01 | Review issues related to the vertical rate in WP25-03, Change Item #26 and propose deletion of MOPS materials and a new Note to be added as guidance. | Chris Moody | Due < 6 August |
| 25-02 | Propose text for implementing the "Single Antenna" Flag in both Link MOPS. | Rich Jennings<br>Tom Pagano | Due < 6 August |
| 25-03 | Starting with UAT-WP25-09, add more information as an introduction as to why the scenarios were used and specify where in Appendix K to put this. Reference the multipath paper from Stan Jones. | Larry Bachman | Due < 6 August |
| 25-04 | Specify requirements and test procedures for the Target State Element based on agreed UAT-WP25-10 | Tom Mosher | Due < 6 August |
| 25-05 | Double check as to whether or not the Ground Systems are expecting to use the "Receiving ATC Services" Flag. | Mike Garcia | Due < 6 August |
| 25-06 | Based on the review and agreements for UAT-WP25-07, specify specific text in requirements and test procedures to implement the required changes for the Mode Status Element in DO-282B. | Chris Moody | Due < 6 August |
| 25-07 | Based on the review of UAT-WP25-12 regarding the text from the STP MOPS that needs to be retained in the Link MOPS, Larry agreed to draft requirement and test procedure text for both MOPS on the horizontal source selection and propose a location in both documents. | Larry Bachman | Due < 6 August |
| 25-08 | Create a draft of a new appendix to specify the formats of Version=1 messages. | Gary Furr | Due < 6 August |
| 25-09 | Write some text to replace the MASPS Compliance Matrix Appendix stating that in previous MOPS versions the Matrix was required to ensure that the MOPS complied with MASPS requirements, but that the matrices will be moved to the MASPS in the future. | Stuart Searight<br>Dean Miller | Due < 6 August |

9. The **Working Papers** for all WG-5 Meetings, as well as the Meeting Agendas, Meeting Minutes, and Meeting Schedules are posted on the ADS-B UAT MOPS web site maintained at the FAA William J Hughes Technical Center, located at:
   **http://adsb.tc.faa.gov/WG5.htm**