



RTCA Paper No. 100-21/SC206-182 EUROCAE Paper No. 119-21/WG76-61 May 7, 2021

Summary of the 63rd Meeting RTCA Special Committee 206 (SC-206) Summary of the 59th Meeting EUROCAE WG-76 Aeronautical Information Services (AIS) and Meteorological (MET) Data Link Services

Executive Summary

The joint RTCA SC-206 / EUROCAE WG-76 Plenary meeting was held on March 25, 2021. The meeting was held virtually due to existing travel restrictions.

- SG-1 Aircraft-based Observation (AbO) Requirements
 - o Automatic Dependent Surveillance Broadcast (ADS-B) Weather (Wx) implements Aircraft-Based Observations (AbO) via ADS-B
 - o Includes automated Air Reports (AIREP) and semi-automated Pilot Reports (PIREP)
 - ADS-B Wx required major revisions to the 1090ES ADS-B Minimum Operational Performance Standard (MOPS) and lesser revisions to the Mode S Transponder MOPS
 - In December 2020, the RTCA Program Management Committee (PMC) agreed to publish a revised 1090ES ADS-B MOPS (DO-260C) and Mode S Transponder MOPS (DO-181F)
 - o In January 2021, SC-186 Working Group (WG-5) began the process to harmonize UAT ADS-B MOPS (DO-282B) with revised 1090ES ADS-B MOPS (DO-260C)
 - The Weather Surveillance Activity Team (WxS AT) is implementing ADS-B Wx
 - The effort will work to harmonize the UAT MOPS with the 1090ES ADS-B MOPS
 - o Coordination ongoing with:
 - o Weather community (FAA, NOAA/NWS, AMS, WMO, FPAW)
 - o Other standards bodies and regulators (EUROCAE, ICAO, EUROCONTROL, FAA)
 - Manufacturers and Operators

• SG-5: FIS-B MOPS

- DO-358B, Minimum Operational Performance Standards (MOPS) for Flight Information Services – Broadcast (FIS-B) with Universal Access Transceiver (UAT), was approved for publication by the RTCA PMC in March 2021
- The DO-358A Supplement Errata Test File was approved for publication by the RTCA PMC in March 2021
- o All active products are in the FIS-B uplink nationwide
- o SG-5 activities are complete at this time
 - o However, SG-5 may be reactivated next year (2022)
 - It is anticipated that the industry will go from Traditional Alphanumeric Code (TAC) to XML technology

- Aeronautical information will then be in some new digital format for the uplink, which may constitute a major revision to DO-358B
- SG-6: MASPS
 - o SG-6 is conducting 2-day virtual WG meetings
 - o These 2-day virtual meetings will continue
 - o Holding bi-weekly meetings to develop the Collaborative Decision Making (CDM) Airborne Reroute Information (ARI) Service Description
 - o During the week, SG-6:
 - o Completed the Winds Temperature Aloft (WTA) Operational Performance Assessment
 - o Reviewed and edited the Collaborative Decision Making (CDM) Airborne Reroute Information (ARI) Service Description
 - o WG-3 (CDM) is making progress
 - o One of their main tasks is developing what the actual minimum information content should be and how good that information needs to be
- Industry briefings were presented on the following topics (briefing slides can be found at: https://aeropus.i3cloudservices.com/Group/GroupLanding/99 (Documents/2021 Meetings/March 23-25, 2021 63rd Meeting)
 - o ASTM Committee F38 Efforts
 - o Collaborative Decision Making (CDM) Update
 - o ADS-B Turbulence
 - o ADS-B Weather Implementation
 - o Industry Turbulence Safety Action Team (ITSAT) / DO-370 Update
 - o Unmanned Aircraft Systems (UAS) Urban Air Mobility (UAM) Update
- Next Meeting:
 - o June 22-24, 2021 (Virtual)
 - Joint RTCA SC-206 (Meeting 64) / EUROCAE WG-76 (Meeting 60) Plenary

Joint Plenary Meeting Summary

The joint RTCA SC-206 / EUROCAE WG-76 Plenary meeting was held on Thursday, March 25th. The meeting was held virtually due to existing travel restrictions.

Presentations are posted at:

https://aeropus.i3cloudservices.com/Group/GroupLanding/99 (Documents/2021 Meetings/March 23-25, 2021 – 63rd Meeting)

Thursday, March 25th Plenary

The Plenary convened at approximately 0900 EDT

- 1. Welcome and Opening Remarks
 - Reference the 2021 March SC-206 WG-76 Plenary Leadership Slides final
 - Karan and Alex briefed their respective RTCA and EUROCAE slides
 - Karan noted that RTCA Workspace users will receive an email in the near future from RTCA regarding the switchover to the AerOpus platform
- 2. Introduction of Attendees

•	Rocky Stone, Co-chair	United Airlines
•	Mark Libant, Co-chair	NAV Canada

• Joe Bracken, Secretary AvMet Applications, Inc.

• Eldridge Frazier FAA, Government Authorized Representative

• Steve Abelman AvMet Applications, Inc.

Moin Abulhosn
 FAA

• Jeff Aenmey European Cockpit Association; EUROCAE

Louis Bailey The Boeing Company
 Don Berchoff TruWeather Solutions
 Gary Bobik Safety Net Solutions
 Bill Carson The MITRE Corporation

Larry Cornman NCARJim Dall L3Harris

Steve Darr Dynamic Aerospace, Inc.

Lauren Donohue EUMETNETStephan Dubet EUROCAE DSNA

Alexander Engel EUROCAE (WG-76 Technical Programme Manager)

John Ferrara ConsultantTammy Flowe FAA

• Izabela Gheorghisor The MITRE Corporation

• Karan Hofmann RTCA, Inc. (SC-206 Program Director)

Amanda Hoprich AvMet Applications, Inc.

Ed Johnson FAA

Deborah Kowalewski
 Robert Lee
 Michael McPartland
 Macarena Martin-Viton
 Airline Dispatchers Federation
 AvMet Applications, Inc.
 MIT Lincoln Laboratory
 Airbus (WG-76 Secretary)

Jim Mills
 HQ USAF/DoD

Madhu Niraula Collins Aerospace

• Frank Oley A4A

Mark Phaneuf Air Line Pilots Association, Intl

• Tim Rahmes The Boeing Company

Charles Thomas L3HarrisSteve Young NASA

• Dirk Zinkhan EUMETNET EIG

- **3.** Review and Approval of Meeting Agenda
 - The meeting agenda for this week was approved
- **4.** Review and Acceptance of Meeting Summary of Joint RTCA SC-206 (Meeting 62) / EUROCAE WG-76 (Meeting 58) Plenary
 - Rocky Stone made a motion to accept the Meeting Summary
 - o Jim Mills seconded the motion
 - The Meeting Summary was approved
- **5.** Report of Sub-Groups:
 - SG-1: Aircraft-based Observation (AbO) Requirement
 - o Reference the <u>2021-03-25 SG-1 Plenary Update</u> slides
 - o Ed Johnson provided the SG-1 status briefing
 - o Rocky Stone noted that he will have questions on the weather parameters that will be contained in the TSO, but will direct those to Steve Darr
 - o Rocky stressed that Ed and Steve have done a remarkable job of incorporating weather parameters in ADS-B
 - o Reference Slide 4
 - Alex Engel asked Ed if he could provide additional information on the last bullet
 - 1. Ed responded that they have begun working on an interface specification
 - 2. The information will be transmitted via ADS-B Version 3 (V3) in order to develop the technical specifications for the ground system
 - 3. The eventual plan is to develop a joint interface specification that includes handling of all new Version 3 ADS-B messages
 - 4. Alex indicated that Europe has initiated planning to receive, process, and distribute new messages in the V3 ADS-B MOPS (ED-102B)
 - Rocky noted that Europe is one of few places where enhanced Mode-S is in place
 - 1. Alex added that this will be an additional means of displaying information
 - 2. Alex stressed that he does not think they will be replacing ground radars with aircraft-based ADS-B
 - SG-5: FIS-B MOPS (DO-358B) FRAC Resolution
 - o There were no slides presented
 - o John Ferrara provided the briefing
 - o John stated that the RTCA PMC was held on March 18th

- All documents presented by SG-5 were approved for publication
- Therefore, SG-5 is essentially done at this time
- o John added that he has spoken with L3Harris and all active products are in the uplink nationwide
- o Rocky thanked John and his team for their good work
- o Eldridge reiterated that thanks to John in updating DO-358A to Version B
 - Eldridge added that John gave an excellent briefing to the PMC and there were no questions or discussion from the PMC
- Rocky asked if anyone was aware of any plans for changes in the uplink or plans to ask SC-206 to reinstate SG-5
 - Eldridge responded that SG-5 may be reactivated next year (2022)
 - 1. It is anticipated that the industry will go from TAC to XML technology
 - 2. Aeronautical information will then be in some new digital format for the uplink, which would constitute a major revision to DO-358B
- WG-76 and SG-6: MASPS (DO-364A)
 - o Reference the SG6 2021 March Plenary WG-76 SG-6 Closing slides
 - o Eldridge Frazier provided the briefing
 - o Eldridge noted that SG-6 is conducting 2-day virtual WG meetings
 - These 2-day virtual meetings will continue
 - They are also holding bi-weekly meetings to develop the CDM ARI Service Description
 - o Eldridge noted that he believes SG-6 is approximately 9 months behind schedule
 - However, they are progressing well and gaining momentum
 - o Rocky offered a comment regarding WG-3 (CDM)
 - WG-3 is making progress
 - One of their main tasks is developing what the actual minimum information content should be and how good that information needs to be
 - 1. Steve Abelman commented that any inputs into how to measure a product's accuracy would be appreciated
 - 2. Rocky added that they are struggling with this task
 - 3. Any assistance that could be brought to the group would be appreciated
 - Rocky stressed that Steve is providing excellent benefit to the WG

6. Industry Coordination

- ASTM Committee F38 Efforts
 - o Reference the ASTM F38 RTCA Presentation 24 Mar 2021 slides
 - o Don Berchoff provided the briefing
 - o Don mentioned that ASTM is looking at closing the weather gap in the lower altitudes of the boundary layer, where drones operate
 - We need to close weather data gaps
 - The weather product infrastructure has a gap in the lowest 5,000' of the atmosphere
 - o Don noted that he was able to convince ASTM to begin a weather group and that the FAA is becoming more concerned with Beyond Visual Line of Sight (BVLOS)
 - There are a lot of challenges

- ASTM F38 Committee is looking for ideas and help on how to address these challenges and find the appropriate solution(s)
- o ASTM is determining how to build a weather standard that is cognizant of the fact that some areas need better fidelity than others
 - Reference slides 7-10 for specifics on the nature of the work ASTM F38 is engaged in
- o Rocky noted that CDM is trying to determine a minimum set of weather criteria for air carrier aircraft
 - They have discussed the methodology of how to get the weather providers qualified
 - There may be some "lessons learned" that CDM and F38 can share
- Collaborative Decision Making (CDM) Update
 - Frank Oley provided the update
 - o There were no slides presented
 - o Frank noted that in 2019 they were tasked with exploring weather in the cockpit
 - Their findings and recommendations concluded that there was quite a bit of merit
 - Some items warranted further investigation beyond his group
 - o They struggled to determine how it all tied together and how to make it work
 - Frank noted that with respect to TBM and cockpit tasking; you cannot do much of anything to one without impacting something else
 - They concluded that there were benefits to be gained by having weather in the cockpit
 - Areas of benefit included:
 - 1. Pilot awareness
 - 2. Safety
 - 3. Communication
 - i. With respect to communications, the question of how communications between the pilot, controller, and dispatcher should take place
 - ii. The communications must be timely enough to have value
 - o The work that Frank is engaged in deals with rules of engagement
 - o Frank agreed that regular communication with the NextGen Office was necessary
 - o There are a few other tools out there now by commercial developers
 - May start to close the loop on some of this
 - Rocky commented that he is looking at some of the Trajectory Based Operations (TBO) aspects from the weather perspective
 - It is important that people understand that SC-206 trying to identify the minimum information content
 - If they are able to succeed in defining something that is usable, Rocky feels that the CDM community can use it and it will provide a benefit
 - Rocky asked Frank if the CDM community feels there is value in setting up a minimum information content
 - 1. Frank concurred and noted that there will be value to be had
 - 2. The need for this minimum information cannot be ignored
 - 3. There must be collaboration between all the players, and the cockpit must be included

- The TBO and Future Flow Concepts team has made recommendations to the NAS Collaboration Committee
 - The biggest struggle is how this all fits together and ensuring the right people are at the table
- Alex Engel asked if Frank has any influence from a non-US perspective on operations
 - Frank responded that they have only focused on domestic operations in the National Airspace System (NAS) and are not at the international level yet
 - Rocky commented that although convection is rare in Europe, when it occurs, it is handled much differently

ADS-B Turbulence

- o Larry Cornman provided the briefing
- o Reference the RTCA Briefing ADS-B Turbulence March 2021 slides
- o Reference Slide 3
 - Rocky asked if, even with low sample rates, they are getting a correlation from ADS-B Out
 - 1. Larry responded in the affirmative and that they can see the signal that relates to Eddy Dissipation Rate (EDR) being measured on the aircraft
 - i. However, they are also able to see the effects of maneuvers and waves
 - 1. Those need to be filtered out
 - ii. They may not be able to get turbulence at the lowest levels
- Rocky asked if Larry is looking at different aircraft types to see if installation makes a difference
 - Larry responded that there will be data coming from any/all aircraft reporting ADS-B
 - 1. Larry would ideally like to obtain data from all of them
 - 2. The data will need to be scaled for each aircraft class
- o Rocky noted that we are now on V3 of ADS-B
 - Someday there may be a V4
 - Larry commented that he is interested in who he needs to speak with to make the data request
 - Rocky responded that Ed Johnson and Steve Darr would be the appropriate individuals to speak with
- o Reference Slide 10
 - Alex noted that he is also working with SC-186
 - 1. Alex commented that Steve mentioned they are wanting final resolution on the 64 ft/min quantization of vertical rate, with no change to the data
 - 2. Alex asked if lowering the resolution, resulting in the upper limit being smaller, would be acceptable
 - 3. Larry responded that it is important to realize that Larry is not the primary user of the data
 - i. If they are able to pack more information in the available bits, that would be best
 - ii. This may result in changes as to how the bits are used
 - Moin Abulhosn asked if the ADS-B office has been briefed on this

- 1. Rocky responded in the negative
- Steve commented that he and Larry have spoken before
 - 1. Rocky is the chair of the SC-186 group which is responsible for maintaining Standards
 - 2. Regarding vertical rate, this has a fairly high range, although the resolution is not great
 - i. This is not a required parameter per the 91.227 Rule
 - 1. It is a non-required field in a required message
 - 3. Trusting data coming from an aircraft needs to be addressed up front
 - i. Given that some data is not required, it may be random and not meaningful
 - 4. Steve added that it looks like there is real potential here and warrants continued investigation
 - 5. Larry noted that quality control of the data is very important
 - 6. Larry and Steve agreed to discuss the requirement aspects offline
- o Mark Libant asked Larry how important it is to get live data (streaming) versus data that has a 5-minute lag in a data message
 - Larry responded that that is an operational question
 - 1. When using the aircraft as a sensing platform, and given the variability of the atmosphere, a 5-minute delay may not be bad
 - 2. Larry added that the user of the information would be the pilot in trail, therefore the impact of delays in information depends on the location of the trailing aircraft
- o Rocky noted that this is an intriguing idea and asked if there is an EDR field in an ADS-B message
 - Steve Darr responded in the affirmative and noted that in the V3 Standard, there is a message that includes mean EDR, peak EDR, and peak EDR offset
 - 1. However, this is also a non-required field in a required message
 - 2. There is an appendix in the current Standard that provides guidance on sourcing and recommendations on windowing and other items that were not addressed in the EDR Standard that SC-206 published years ago
- o Steve noted that Larry's work is interesting, but there are challenges
 - We now have a standard for reporting turbulence; we just need the means to do so (manufacturers need to build the boxes and operators need to equip)
- o Larry stated that the reason they started down this route was due to limited aircraft reporting of EDR
 - If all aircraft reporting ADS-B have a means to calculate and provide EDR / turbulence information, we would not need this effort
- o Ed Johnson stressed that how this is validated as a technique will be very important and translated into a product that the users are comfortable with
 - Rocky commented that it will be interesting to see if vertical acceleration on different aircraft types is equivalent
 - 1. Larry concurred with Rocky and Ed
- ADS-B Weather Implementation
 - Steve Darr provided the briefing
 - o Reference the 2021-03-25 ADS-B Wx Implementation Update slides

- o Reference slides 2 and 3 for specifics on Standards development work in 2021 and beyond as well as their next steps for ADS-B Weather
- o Rocky asked where the work is being done that is taking onboard EDR and delivering it to the transponder
 - Steve responded that ARINC documents 718 and 735 are being updated by ARINC to provide for interoperability at the installation level
 - 1. Both address extraction off of the 429 busses to connect with the transponder
 - 2. EDR information is a dynamic input and comes across whatever bus the operator chooses to use
 - Rocky asked for clarification by asking about aircraft that do not have a designated EDR system and if they provide 0's
 - 1. Steve responded that if an aircraft does not have an EDR capability, they are unable to feed the transponder with the information
 - i. Therefore, they would provide an "invalid data" message (all 0's) versus no turbulence
- o Tim Rahmes asked if the associated TSO is in development
 - Steve responded in the affirmative
 - 1. The TSO is similarly structured as the last one in that the user must comply with all of Section 2 in the DO document
 - 2. There is some internal review going on within aircraft certification on the TSO
 - i. To date, the TSO has not been released for broader FAA review
 - 3. Steve added that the FAA will invoke DO-260C; basically without change
 - i. The intent is to get it out for wider review and then deal with the aircraft
- o Alex Engel commented that EUROCONTROL, in cooperation with EUROCAE, has started an All Purpose Structured EUROCONTROL Surveillance Information Exchange (ASTERIX) Maintenance Group, to fully incorporate ADS-B V3
 - However, the process will take some time
 - Steve commented that his group is also in coordination with the FAA (Doug Arbuckle) to harmonize the ASTERIX categories
 - 1. Doug Arbuckle has been coordinating with RTCA and EUROCAE
- Industry Turbulence Safety Action Team (ITSAT) / DO-370 Update
 - o Reference the ITSAT Update to SC206 20210325 slides
 - o Tammy Flowe provided the briefing
 - o Tammy noted that the high-priority issue is to determine how each of the turbulence measuring products compare
 - o Tammy stated that she believes SC-206 should leave DO-370 alone and consider developing an entirely new document
 - Tammy added that at this time she is unsure what that document should be
 - Rocky concurred
 - Tammy noted that for those individuals / operators using iPad accelerometers to determine turbulence and vertical accelerations, it is difficult to fit those into the DO-370 document

- Tammy added that it is unclear how to integrate all these different turbulence identification technologies into the SC-206 construct
- o Ed Johnson commented that he and Steve Darr are trying to stay engaged in the ITSAT work; from an SG-1 and Wake perspective
- o Mark Phaneuf commented that at the last Turbulence Workshop, the NTSB indicated that they would be issuing a report in the March / April 2021 timeframe
 - Tammy responded that she believes the release will actually be in the summer timeframe
 - Tammy suggested that the NTSB provide a briefing to SC-206 on their work
 - 1. The NTSB has collected some good data on not just accidents, but also how the carriers are using the data
 - Action: Tammy to follow up and coordinate an NTSB briefing at the June 2021 Plenary or September 2021 Plenary related to the NTSB Turbulence Study
- Unmanned Aircraft Systems (UAS) and Urban Air Mobility (UAM) Update
 No update was provided at this time

7. TOR Discussion

- There are no changes to the TOR at this time
- Future changes will primarily be to deliverable dates
 - o However, given the current status of the efforts, there is no need to discuss revised deliverable dates or make changes to the TOR at this time
- **8.** Future Meetings, Plans, and Dates
 - June 2021 Meeting Dates
 - o The June meeting will be conducted virtually
 - o The dates of the June meeting were changed to June 22-24, 2021
 - o The June Plenary will follow the same format as the March Plenary
 - September 2021 Meeting Location
 - o Eldridge proposed holding the September Plenary virtually
 - Eldridge is almost certain the FAA will not be traveling at that time
 - Alex asked if others could travel to the FAA instead
 - Eldridge responded that he is unsure if the FAA facilities will be open at that time
 - It was suggested that the meeting be moved to RTCA since fewer individuals from Europe would be traveling
 - o Jim Mills suggested swapping the September 2021 and December 2021 meeting venues
 - Eldridge responded that the Committee should consider both proposals
 - Action: Leadership should consider moving the September 2021 Plenary to the RTCA facility in Washington, DC
 - This will be discussed at the next Leadership telecon
 - Karan Hofmann indicated that she would "pencil in" the September 2021 meeting on the RTCA calendar

- Alex indicated that he will delay cancelling rooms in Brussels until the leadership decides about meeting location at the next leadership telecon
- 2022 Meeting Dates / Locations
 - o Eldridge proposed the following:
 - March 2022 Brussels
 - June 2022 Ottawa
 - September 2022 Airbus
- The following table of future meeting dates / locations was discussed

Meeting Dates	Locations (Hosts)	Releases / Approvals
June 21-25, 2021	Virtual	Joint WG-76/SC-206 Plenary (SG1 & SG6)
September 20-24, 2021	Brussels (TBD)	Joint WG-76/SC-206 Plenary (SG1 & SG6) DO-364A FRAC Release (delayed)
December 6-10, 2021	Washington, DC (RTCA)	SG6 – DO-364A FRAC Resolution Review/Plenary approves release of DO-364A to PMC (delayed)

9. Action Item Review

- Action Item 372
 - o This Action Item was Closed
- Action Item 374
 - o This Action Item to remain Open
- Action Item 375
 - o This Action Item was Closed
 - o There is no movement anticipated on this within the next 9 months
- Action Item 377
 - o This Action Item was Closed
- Action Item 378
 - o This Action Item was Closed
- The current SC-206 Plenary Action Item list is below
 - o The 2 new Action Items identified during this Plenary are denoted in the table below and shaded in green

#	Owner	Action	Date	Due Date	Status				
Open Action Items									
372		Refer to closed Action Item #348							
		Pull all recommendations made to RTCA							
	Eldridge	regarding SC-206 involvement in uplinking	August	September	Closed				
	Frazier	AIS/MET information to UAS operators, and	2020	2020	March 2021				
		present at the September 11 th SC-206							
		Leadership Meeting							

374	Steve Young	Develop proposal / rationale for change to SC-206 TOR to address UAS/UAM gaps in weather information	August 2020	December 2020	Open
375	Tammy Flowe	Engage with SC-206 Leadership to discuss potential future SG-4 work and invite SC-206 Leadership to bi-weekly ITSAT telecons	August 2020	December 2020	Closed March 2021
377	Rocky Stone	Contact Frank Oley (A4A) to provide a CDM briefing at the March 2021 Plenary	December 2020	March 2021	Closed March 2021
378	Karan Hofmann	Karan to look into meeting space for December 2021 Plenary	December 2020	March 2021	Closed March 2021
379	Tammy Flowe	Tammy to follow up and coordinate an NTSB briefing at the June 2021 Plenary or September 2021 Plenary related to the NTSB Turbulence Study	March 2021		Open
380	Leadership	Consider moving September 2021 Plenary to RTCA facility/DC area	March 2021		Open

10. Other Business

- Rocky and Mark Libant commented that the Plenary was a good meeting with a lot of good information exchanged
 - o The SGs and WGs are making good progress
- Karan reiterated RTCA's switch to their new server system
 - o Presentations from today's Plenary will be posted to the new AerOpus server by next week

11. Adjourn

The Plenary adjourned at approximately 1200 EDT on Thursday, March 25th.

CERTIFIED as a true and accurate summary of the meeting.

Joe Bracken, SC-206 Secretary

Macarena Martin-Viton, WG-76 Secretary

Rocky Stone, SC-206 Co-chair

Mark Libant, SC-206 Co-chair