



THE GOLD STANDARD FOR AVIATION SINCE 1935

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RTCA, Inc.
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RTCA Paper No. 042-20/SC135-728
October 24, 2019

SUMMARY OF THE SEVENTY-FIFTH MEETING

RTCA SPECIAL COMMITTEE 135
ENVIRONMENTAL CONDITIONS AND TEST
PROCEDURES FOR AIRBORNE EQUIPMENT

The Seventy-fifth meeting of RTCA/SC-135 was held October 21st through 24th, 2019 at Garmin AT in Salem Oregon.

The following were in attendance:

Bradley Green, SC-135 Chairman
Jacob VanDyke, SC-135 Secretary
Rebecca Morrison, Program Director

EaglePitcher Technologies
Honeywell International, Inc.
RTCA, Inc.

Patrick Andre
Susan Beard *
Massimiliano Bertoldi *
Erik Borgstrom
Jeremy Cline
Nick Clinkenbeard *
Jonathan Coke
Nick Conquest
Charlie Cooper
John Covell
William Donoghue
Mike Falzone
Brad Green
Scott Hanaway

Andre Consulting, Inc.
Rockwell Collins, Inc.
CELAB SRL
Element Materials Technology
Rhodes & Schwartz
Collins Aerospace
Rhodes & Schwartz
NIAR
Collins Aerospace
Collins Aerospace
United Technologies Corporation
Garmin Ltd
EaglePicher Technologies
Astronautics Corporation of
America



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Jim Hatlestad
Terri He
Barry Jackson*
David Jennings
David Jerrell

David Kerr
Evelyn Matheson*
Jerome Mavier
Kyle McMullen
Milford, Brock*
Terry Milks*
Scott Miller*
Rebecca Morrison
Lee Nguyen*
Neal Pence
Marc Poncon
Mario Rinaldi*
Harlan Sharpe
David Sherman*
Tim Steinbach*
Eric Stewart
Alan Thompson
Chuck Thompson*
Randy Tsuchiyama*
Jacob VanDyke
Gary Van Hoy
Merrill Vaughan
Ken Webb

The Boeing Company
The Boeing Company
Cahon Systems Inc
Collins Aerospace
General Atomics Aeronautical
Systems
Garmin Ltd.
The Boeing Company
Airbus
NIAR
NIAR
Collins Aerospace
Eagle Management, LLC
RTCA
FAA
Honeywell International
Airbus
Collins Aerospace
NIAR
Elite Test
Collins Aerospace
Collins Aerospace
Element Materials Technology
Elite Test
Teledyne
Honeywell International
Honeywell International
The Boeing Company
Collins Aerospace

* via Conference Bridge

The agenda for the meeting was as follows:

1. Chairmen's Opening Remarks, Introductions.
2. Approval of Summary from the Seventy-Fourth Meeting – (RTCA Paper No. 163-19/SC135-725)
3. Review Draft Ground Station Document
4. Consider a motion to enter FRAC for the Ground Station Document
5. Review Working Group Summaries
6. Review Schedule
7. New / Unfinished Business
8. Establish date for next SC-135 Meetings.
9. Closing.

(**Note:** The following report is organized by Agenda Item, although some sections were conducted out of sequence to accommodate some members' schedules.)

Agenda Item 1 **Chairman's opening remarks, Introductions, Recognize Federal Representative**

The plenary session of the Seventy-fifth meeting of RTCA/SC-135 was called to order at 8:58 AM on the 24th of October, 2019. Chairman Brad Green opened the meeting by welcoming those in attendance. Rebecca Morrison reviewed the RTCA Anti-trust, Proprietary and Membership policies. Mr. Green reviewed the agenda for the meeting, and invited attendees in the room and those attending by conference bridge to introduce themselves.

Agenda Item 2 **Approval of the Summary from the Seventy-Fourth Meeting**

SC-135 Secretary Jacob VanDyke read the minutes from the 74th meeting RTCA Paper No. 168-19/SC135-725, and reviewed the corrections to the 73rd meeting minutes, RTCA Paper No. 163-18/SC135-719. A motion was made and seconded to accept the minutes, and the motion was approved unanimously.



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Agenda Item 3 **Review Draft Ground Station Document**

Discussion was held regarding 57 comments. Changes were classified as Low, Medium High and Editorial. No changes were categorized as Low, 39 changes were classified as Medium, and two changes were classified as High and 16 were considered Editorial. Ultimately, 4 were rejected and the remaining were marked Accepted as Written or Accepted as Modified. Editorial changes were made real-time by the program director, with the more comprehensive changes being returned to the change coordinators for re-work. Change coordinators were requested to make the appropriate changes, with the latitude to make minor editorial changes such as typographical or grammatic updates as identified.

These reviews/edits are due back to the Program Director on December 1st, 2019 who will then distribute the document for FRAC on December 15th. FRAC will be open until January 15th, 2020. The committee will tentatively meet during the week of February 17th at either NIAR in Wichita, KS or General Atomics in San Diego, CA.

The decision was made to make all remaining changes through the commenting tool as opposed to change proposal forms.

Section 9, Earthquake Vibration will have a new table and graph added based upon lower levels. The current levels came out of the MOPs, which are very high and untestable. This is a mandatory change or non-concur votes will result. Research is being done to determine if the industry standard for Earthquake Vibration is public and if so, add this to the document. If not, it is likely this section will be labeled as “Reserved” and discussion will be tabled until Revision A.

A discussion was also held regarding non-concur and FRAC process.

Agenda Item 4 **Consider a motion to enter FRAC for the Ground Station Document**

Motion to enter Final Review and Comment for the Ground Station Document was made and seconded, and the motion was approved unanimously.

Agenda Item 5 **Review Working Group Summaries**

The Working Group discussions were centered on the Change Proposals submitted for Revision H.



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The Change Coordinators described Change Proposals which were reviewed and dispositioned in their respective group meetings. The level of detail in the Plenary session discussions precludes accurate reporting here, so only change proposals creating significant discussion are noted. The actual Change Proposals and any dispositions are found on the SC-135 Workspace and tracked in the Change Proposal Tracking Log, also found on the Workspace.

Sections 1, 2 and 3 – David Kerr, Change Coordinator.

Discussion was held regarding 4 change proposals. Two were reviewed to confirm compliance with WG14 disposition. Two new proposals were discussed, H227 to add lightning direct effects to order of tests, which was Accept as modified and H219 to move common setup into from sections 20/22 into a new section 3.10 which was deferred

Sections 4, 5 and 6– Jake VanDyke, Change Coordinator.

Three change proposals were discussed for Sections 4 and 5. Most notable was a change proposal to address a new test category for Human Mounted Equipment, which was deferred to obtain further industry information.

Two change proposals were discussed for Section 6 to correct figure and text disconnects, both were accepted.

Sections 7 and 8, Merrill Vaughan, Change Coordinator.

Discussion was held to address minimum report requirements, and a CP to correct discrepancies in the Performance vs. Endurance test levels for Curve J was accepted.

Sections 9, 10, 11 and 14 – Harlan Sharpe, Change Coordinator.

Discussion was held regarding six proposals for DO-160, and 2 proposals for DO-357 which were both rejected. For the DO-160 changes, four were withdrawn and one addressing multiple EUTs and one addressing equipment disturbance following the test were rejected.

Section 13 – Alan Thompson, Change Coordinator.

Change proposal CP181 was approved, correcting a typo in the document.

Section 15 – Ken Webb, Change Coordinator.

No change proposals were discussed for this section. Discussion was held regarding setup and measuring the compass location in the test setup. A change proposal will be submitted to formally address this.

Section 16 – Keith Peavler, Change Coordinator (presented by Brad Green)

Change proposal H226 was discuss changing all instances of “Designations” to “Categories” and was accepted as written. Discussion was held regarding a split for Section 16 to separate AC and DC test sections with no resolution on the topic.

Section 18 – Ken Webb, Change Coordinator.

Four change proposals were discussed and dispositioned. Proposals to add steps to limit current and define Max Operating Voltages for AC testing were approved. One proposal to address probe saturation was rejected.

Discussion was held regarding the creation of additional proposals to address figures, Test Report information, Tolerances and ERRATA 19 updates.

Sections 19 and 20 – Jim Hatlestad, Change Coordinator.

One change proposal was discussed for Section 19, H167. This proposal was intended to correct a figure call out and was rejected. Discussion was held regarding CP-H05 for induced spike test. Actions were given to investigate the frequency spectrum and identify a test vehicle to evaluation.

Two change proposals were discussed for Section 20. CP-H19 to address the length of cable exposed to the beamwidth was accepted as modified. CP-H20 to clarity calibration of RF RS Field was deferred for change coordinator action.

The Change Coordinator will schedule interim work group meetings to address more complex change proposals.

Section 21 – Nick Conquest, Change Coordinator.

An equipment vendor provided presentation on FFT Time Domain Receivers for committee review. Change proposal H183 to include FFT measurement was withdrawn, and a proposal to update multiple figures was accepted as modified.

Section 22 – Eric Stewart, Change Coordinator.

No proposals were dispositioned for section 22. Change coordinator presented a report out on AE-2 and WG-31. Discussion was held regarding segregation of cable bundles during testing. Discussion was also held regarding the addition of guidance in DO-357 to ensure inclusion of cable bundle characteristics.



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Section 23 – Brock Milford, Change Coordinator.

No proposals were dispositioned for this section. Change coordinator provided a report out from AE-2 committee and provided the proposed schedule for committee meetings.

Section 25 – Erik Borgstrom, Change Coordinator.

Change proposal CP H-174 was discussed to include contact discharge test method. CP will be deferred for additional discussion.

Section 24 and 26 – Alan Thompson, Change Coordinator.

Seven change proposals were discussed for section 26. CP H-191 and H177 were approved, to correct grammar and changing the burn rate from 4 to 2.5 inches per hour. Two other proposals were accepted, two deferred and one proposal H-141 was rejected.

Discussion was held regarding vent holes with reference to enclosure classification. Additional investigation is being performed to quantify minimum oxygen requirements for propagation.

Committee was briefed on the Flammability Test round robin. The committee is looking for additional participants to evaluate burner placement updates.

Agenda Item 6 Review Schedule

Chairman Green addressed the schedule during the discussion of the ground-based equipment document. The next Plenary meeting will be in February and will only address the Ground Station document. Based on the Revised Terms of Reference (TOR), RTCA SC-135 has committed to presenting the first complete draft of DO160H by Q3 of 2021, to support final release by December 2021. Proposition was provided to update the TOR regarding release dates. This would move the release of DO-160H and DO-357B out 3 years to release in December 2024. Vote was unanimously approved and will be presented to the PMC committee.

Agenda Item 7 New/Unfinished Business

Change coordinator for section 16 has stepped down, going forward position will be held by Keith Peavler.



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Discussion was held regarding the commenting tool usage. Agreement was made to migrate existing CPs into the commenting tool for data management.

Agenda Item 8 **Establish Date for Next SC-135 Meeting**

The next SC-135 meeting will be hosted by NIAR in Wichita Kansas and will focus completely on the Ground Station document. Dates of the meeting will be from Monday, February 17th through Thursday, February 21st, 2019.

Agenda Item 9 **Closing and Adjourn**

Brad Green asked for a motion to adjourn the meeting. A motion was offered, seconded, and unanimously approved. The meeting was adjourned at 1:21 PM on Thursday, October 24th, 2019.

-S-
Bradley Green
Chairman

-S-
Jacob VanDyke
Secretary

Certified as a true and accurate summary of the meeting.