

RTCA Paper No. 014-16/SC135-705
January 29, 2016

SUMMARY OF THE SIXTY-SIXTH MEETING

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

The Sixty-sixth meeting of RTCA/SC-135 was held October 27th through 29th at RTCA in Washington, D.C.

The following were in attendance:

Bradley Green, RTCA SC-135 Chairman
Gary Smith, SC-135 Secretary

Honeywell International, Inc.
Honeywell International, Inc.

Ballard, Doug*
Beard, Susan
Cook, Steve
Cummings, Elysabeth
Davidson, Steven
Donoghue, William
Falzone, Mike*
Fletcher, Tim*
Folkersma, Alan
Hall, Patrick
Hatlestad, Jim
He, Terri*
Jordan, Howard
Kamath, Deepak
Kerr, David
Kumbasar, Ahmet Hakan
Marotta, Joe
Matheson, Evelyn

L-3 Communications
Rockwell Collins, Inc.
DNB Engineering
Rosen Aviation
United Technologies Corporation
United Technologies Corporation
Garmin Ltd.
Bell Helicopter Textron, Inc
GE Aviation
Elite Electronic Engineering Inc.
The Boeing Company
The Boeing Company
Textron Aviation
GE Aviation
Garmin Ltd.
STM A.S
Honeywell International, Inc.
The Boeing Company



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Mavier, Jerome
Milks, Terry
Moses, Harold
Nance, Mel
Nguyen, Lee
Peavler, Keith
Poncon, Marc
Pope, Doug
Rehard, John*
Sharpe, Harlan*
Taurand, Christophe*
Unal, Ayhun
VanDyke, Jacob
Vaughan, Merrill*
Walen, David
Webb, Kenneth
Wills, Matthew

Airbus
Rockwell Collins
RTCA, Inc.
Moog, Inc.
Federal Aviation Administration
Honeywell International, Inc.
Airbus
Honeywell International, Inc.
National Technical Systems
NIAR at Wichita State University
Thales Group
STM A.S
Honeywell International, Inc.
The Boeing Company
Federal Aviation Administration
Rockwell Collins, Inc.
NIAR at Wichita State University

* via Conference Bridge

In Accordance with the Federal Advisory Committee Act – Mr. Lee Nguyen of the Federal Aviation Administration was the designated Federal Employee for this meeting.

The agenda for the meeting was as follows:

1. Chairman’s Opening Remarks, Introductions
2. RTCA New Membership Policy
3. Approval of Summary from the Sixty-Fifth Meeting - RTCA Paper No. 127-15/SC135-702
4. New Change Coordinators
5. Review Working Group Activities
6. DO-160G Errata Sheet
7. Review New Change Proposals
8. New / Unfinished Business
9. Establish Date for Next SC-135 Meeting
10. Closing and adjourn.

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

The Sixty-fifth meeting of RTCA/SC-135 was called to order at 9:03 AM on the 29^h of October, 2015. Chairman Brad Green opened the meeting by welcoming those in attendance. Lee Nguyen was introduced as the FAA representative for SC-135. 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 **RTCA New Membership Policy**

RTCA Program Director Hal Moses explained the new RTCA membership policy, which states that organizations with representatives participating on Special Committees are required to be members of RTCA. Representatives of non-member organizations may still attend plenary meetings but will not have access to the RTCA Workspace.

Hal also took the opportunity to describe the RTCA policy regarding Proprietary References in RTCA documents. Any mention of a proprietary product, service or publication must meet certain criteria for inclusion in an RTCA document, primarily that there is a bona fide and relevant reason for such inclusion. The full policy may be found in the Special Committee “Tool Box” document folder in the RTCA Workspace.

Agenda Item 3 **Approval of the Summary from the Sixty-Fourth Meeting**

SC-135 Secretary Gary Smith read the previous meeting's minutes, RTCA Paper No. 127-15/SC135-702. Referencing the minutes, Susan Beard asked about activities described in the new Terms of Reference – would there be assignments? Chairman Green responded that Volcanic Ash and Carbon Dust requirements would be the subject of subsequent discussion activities. A motion was made and seconded to accept the minutes as presented, and the motion was approved unanimously.

Agenda Item 4 **New Change Coordinators**

Chairman Brad Green announced some new Change Coordinator assignments. New member John Rehard of National Technical Systems will be the Change Coordinator for Sections 6 (Humidity), 12 (Sand and Dust) and 13 (Fungus). Veteran SC-135 member David Kerr will assume Change Coordinator duties for Sections 1 (Purpose and Applicability), 2 (Definitions of Terms) and 3 (Conditions of Test). Harlan Sharpe also took on Section 14 (Salt Spray) in addition to his existing responsibilities for Sections 9 (Explosion Proofness), 10 (Waterproofness) and 11 (Fluids Susceptibility). Brad thanked John, David and Harlan for volunteering to fill these vacancies.

Agenda Items 5 and 7 **Review Working Group Activities, Review New Change Proposals**

The Working Group discussions also included discussions of the Change Proposals submitted for Revision H.

Sections 4 and 5 - Jake Vandyke, Change Coordinator. Only one Change Proposal so far.

Sections 7 and 8 - Merrill Vaughan, Change Coordinator. Merrill recently added some additional historical notes from his predecessors at Boeing regarding the evolution of vibration requirements in DO-160, which can be found on the Workspace.

Proposed changes discussed include:

- Additional High Level, Short Duration vibration profiles, per Gulfstream request
- Deleting references to analog vibration controls
- Deleting the SRS shock option
- Re-packaging the Impulse shock and Sustained acceleration requirements
- Addressing the requirement for certain equipment to be operating during vibration test
- Information required to be included in the Environmental Qualification Form

During the Section 7 and 8 report, a separate discussion started regarding the specific contents of the Environmental Qualification Form (EQF). An Action Item was noted for the Committee to address the EQF content, and it was suggested that such information should reference the test reports.

Susan Beard questioned whether the caution note in Table 7-1 should address flight and ground limit loads.

Sections 9, 10, 11 and 14 – Harlan Sharpe, Change Coordinator. A Change Proposal was accepted to clarify that equipment performance shall be demonstrated immediately after exposure to water in Section 10.3. A Change Proposal to add drinks as a class of fluids to Section 11 was deferred, with the action for the Working Group to address the entire Fluids table and submit a new Change Proposal. A Change Proposal to refine the wording of the test procedure in Section 14.3 was accepted as modified.

Section 16 – Joe Marotta, Change Coordinator. Change Proposals to break Section 16 up into AC and a DC sections were rejected. Other Change Proposals to improve the wording were accepted. A Change Proposal regarding the generation of voltage distortion was rejected with the recommendation that it be considered for the User Guide.

Sections 19 and 20 – Jim Hatlestad, Change Coordinator. Several Change Proposals for Section 20 were reviewed and acted upon. A Proposal regarding cable lengths exposed to half- or quarter-wave was accepted in principle, but it requires further discussion with the Working Group. A related Proposal was rejected but will be considered for the User Guide. A Proposal to add a figure to clarify the test

setup was accepted. A Proposal to add a receive antenna in Figure 20-13 was rejected, and a Proposal regarding LISN impedance was rejected as a requirements change but may be modified for inclusion in the User Guide.

Section 21 - Matt Wills, Change Coordinator. A Change Proposal regarding bundling power and I/O cables was accepted in principle, but it needs a supporting figure.

Dave Walen submitted a Change Proposal from the floor to require a tabulation of the frequencies and amplitudes of the peak emissions, rather than relying on the graphical plots alone.

Agenda Item 6 **Final DO-160G Errata Sheet**

Secretary Smith reported that new errata had been recently submitted, so a final version was not ready. The existing Errata revision available on the Workspace will be re-formatted for consistency and to provide the errata page-by-page. It will be posted to the Workspace before the next meeting.

Agenda Item 8 **New/Unfinished Business**

Chairman Green opened this section of the agenda with addressing the data which appear in environmental test reports, and suggested that SC-135 should provide guidance as to the content of test reports, but without specifying a format.

Ken Webb suggested that each Change Coordinator should prepare a list of required data for their respective Sections. Brad Green said that these should be included in DO-160 and not in the User Guide.

Gary Smith stated that a Rolling Action Item List (RAIL) should be established, which would help keep the Committee from forgetting actions and commitment between meetings. He volunteered to create a RAIL before the next meeting. The current Action Items include:

- Brad Green to find someone to speak to SC-135 about Integrated Modular Avionics at the next meeting
- Ken Webb to create an *ad hoc* committee to study the question of creating a new Ground Reference Fluctuation (GRF) section and make a recommendation to SC-135 at the next meeting.
- SC-135 to vote up or down on creating a new GRF section at the next meeting.
- All Sections – review graphics (Figures, tables, etc.) to ensure they are all in digital format, in 2016.
- Change Coordinators review the Errata Sheet before the next meeting.
- Distribute the RTCA Style Guide to all Change Coordinators

Ken Webb said that the proposal to create a new Section for Ground Reference Fluctuation was not well received. He said he would create and lead an *ad hoc* committee to research the issue and make a recommendation to proceed or not at the next plenary meeting.

On the subject of PEDS, Ken Webb stated that EUROCAE WG99 is coordinating with SC-135 to ensure that the HIRF requirements are aligned.

David Kerr asked about aligning the revision levels of both DO-160 and the User Guide, DO-357, when the next revisions are released. Hal Moses recommended that Chairman Green provide a recommendation to the Program Management Committee to synchronize the two document revision levels.

Brad Green reviewed the DO-160 and DO-357 Revision schedules with their respective milestone dates.

Agenda Item 9

Establish Date for Next SC-135 Meeting

The next SC-135 meeting is planned for March 29-31 at the Honeywell Deer Valley facility in Phoenix, AZ.

Agenda Item 10

Closing and Adjourn

Dave Walen moved to adjourn the meeting, which was seconded and unanimously approved. The meeting was adjourned at 12:38 PM on Thursday, October 29th, 2015.

Certified as a true and accurate summary of the meeting.

-S-
Bradley Green
Chairman

-S-
Gary Smith
Secretary