

TERMS OF REFERENCE
Special Committee (SC) 135
Environmental Testing
(Revision 09-26-2024)

SC LEADERSHIP:

Position	Name	Affiliation	Telephone	email	Change
Chair	Kyle McMullen	NIAR	316- 978-8281	kmcmullen@niar.wichita.edu	
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BACKGROUND:

Special Committee 135 (SC-135) published the first version of DO-160() in February 1975. It has been periodically updated, so that it is now at revision G. DO-160() defines minimum standard environmental test conditions and standardized procedures for airborne equipment environmental tests. These tests provide a means to determine the performance of airborne equipment in environmental conditions representative of those encountered when the equipment is installed and operated on aircraft.

DO-160() is referenced in a wide range of specifications and standards. RTCA references DO-160() in minimum operational performance standards (MOPS). Regulatory authorities throughout the world refer to DO-160() in standards such as FAA technical standard orders (TSOs), and advisory circulars (ACs). Aircraft, avionics, and equipment manufacturers refer to DO-160() in equipment specifications. Test laboratories rely on DO-160() for standard test procedures.

SC-135 has worked and will continue to work collaboratively with EUROCAE WG-14(), which has produced EUROCAE document ED-14(), which is technically identical to DO-160().

SC-135 maintains an active group of change coordinators that are experts in their sections and provide guidance on interpretation of the requirements and test procedures to the industry.

DELIVERABLES:

Product	Description	FRAC Completion Due Date*	Expected Publication Date	Change
DO-357A: Supplement to DO-160H: User Guide for DO-160H	Update Revision of User Guide for DO-160H, Guidance Material for DO-160H	6/2028	Sept 2028	
DO-160H: Environmental Conditions and Test Procedures for Airborne Equipment	Minimum Standard Environmental Test Conditions (categories) and Applicable Test Procedures for Airborne Equipment	6/2026	Sept 2026	
IR-XXX: High Voltage Power Input for Airborne Equipment	Internal Report of the High Voltage Power Input Task Group	10/2025***	December 2025	New

*Note: Final Review and Comment (FRAC) Completion Due Date refers to the date that the committee plenary approves the document after completing the FRAC Process. SCs should submit the final document at least 45 days before the PMC meeting where it will be considered for approval.

**Note: Projected Publication Date refers to the date that the item will be approved by the PMC and officially published by RTCA.

***Note: As an internal report, there is no expectation of a public review of the document. It will be available to RTCA Members only.

SCOPE and COORDINATION:

Special Committee 135 will work collaboratively with EUROCAE WG-14 for the following:

- a. Develop a new revision to DO-160G and produce an update to RTCA/DO-160G and EUROCAE/ED-14G. The new revision will include rationale, procedures, guidance and

background information for the environmental test requirements, and the updated user guide.

- b. Maintain an active group of DO-160() Change Coordinators to propose recommendations for user guide material to RTCA/DO-160G and to collect change proposal's to RTCA/DO-160G.
- c. Continue coordination with EUROCAE Working Group 14 to develop new revisions to DO-160G and the User Guide for DO160G.
- d. Coordinate with RTCA SC-159, Global Positioning System (GPS), and the appropriate working groups to develop harmonized requirements for radio frequency emissions in the GPS related frequency bands.
- e. Coordinate with the FAA and Flammability Harmonization Working Group on potential new alternative flammability test methods and procedures including testing whole components instead of breaking down electronic devices into individual material samples as currently required.
- f. Chair a working group to work with industry representatives on requirements and testing of the continually changing aircraft power systems. This working group is to propose test conditions for 540 volt dc generators.
- g. Coordinate with the SAE AE-2, Lightning Committee, to address hybrid wire bundle testing.
- h. Coordinate with the SAE AE-4, Civil Aircraft Electromagnetic Compatibility (EMC) Working Group, on equipment EMC qualification.
- i. Coordinate with the Airline Passenger Experience Association (APEX) Technology Committee and EUROCAE WG-99 on investigating whether new requirements are needed for higher frequency test for RF Susceptibility, to address new WiGig and determine who should drive those requirements.
- j. Chair a working group to work with industry representatives on requirements for aligning Audio Susceptibility requirements to that of MIL STD-461 and to bridge the frequency gap between audio frequency susceptibility and RF frequency susceptibility
- k. Chair a working group to work with industry representatives on requirements for developing a proposal developing a method on a faster alternative to the current reverb chamber uniformity calibration.
- l. Chair a working group to work with industry representatives and EUROCAE WG-14 on considering requirements for volcanic ash qualification.
- m. Investigate specific aspect of carbon dust (due to its conductivity) which is now widely present in the aircraft industry.
- n. Address specific aspects of testing of Integrated Modular Avionics. As being a versatile platform for which the supplier may only provide for generic hardware and firmware, with the intent that the end user will implement its own hardware configuration and application software, the hardware and software configuration issues question the ability of the supplier to claim for a DO-160/ED-14 compliance.
- o. Investigate to replace 19.3.5 with a test procedure similar to MIL-STD-461 CS115.

For Internal Report of the High Voltage Power Input Task Group, members of SC-135 see a need to address High Voltage power in a future version of DO-160(). Currently there is no industry released guidance on Power Input testing of High Voltage Aircraft Systems. Airframe manufacturers are developing their own internal guidance which has no commonality.

Many of the High Voltage Electric Aircraft Manufactures do not have the in-house experience to develop recommended test requirements or test procedures for High Voltage Power Input Testing

Adjusting Current DO-160G Voltage Levels does not provide adequate safety consideration for test levels and in some cases may be too restrictive.

This internal report should also identify any need to liaise with the following groups:

SAE E-40 Electrified Propulsion Committee

AE-10 eVTOL High Voltage Committee – Tom Talor (Boeing) Committee Chair

ASTM - ASTM F2840-14

Automotive ISO 21498-1 & -2

EUROCAE WG-116 High Voltage systems and Components in Aircraft Chairman Remy BIAJUAD, Safran

Any other work discovered that is ongoing on relevant topics

ENVISIONED USE OF DELIVERABLE(S):

Revision H of DO-160 for environmental test conditions and test procedures will be used by equipment manufacturers, aircraft manufacturers, airlines, aircraft operators, aircraft modifiers, test laboratories, and aviation authorities for the design, approval and installation of aircraft equipment. The plan for the future revisions to the DO-160() environmental test conditions and test procedures will consider changes in:

Aircraft and equipment manufacturers environmental test specifications.

Industry Standards (RTCA MOPS, EUROCAE MOPS, SAE MPS)

FAA Advisory Circulars

FAA Technical Standard Orders (TSO's)

The Internal Report of the High Voltage Power Input Task Group will be used by the Program Management Committee to determine the next steps to address the topic with potential RTCA standards and products.

SPECIFIC GUIDANCE:

EUROCAE Coordination – SC135 will continue to coordinate with EUROCAE Working Group 14 so that documents are identical. Any plan for future revisions of DO-160() and ED-14() will be agreed upon between SC-135 and WG-14. Any plan for future revisions of DO-160() and ED-14() require approval by the RTCA Program Management Committee and the EUROCAE Council.

Additional Coordination for DO-160H and DO-357A:

FAA

Advisory Circular AC 21-16G

FAA Flammability AC and Handbook
 SC-159
 RF emissions in GPS frequency bands
 SAE AE2
 Lightning Test Procedures
 Department of Defense
 US Army
 US Navy
 US Air Force
 NASA

Additional Coordination for IR-XXX:

SAE E-40 Electrified Propulsion Committee
 AE-10 eVTOL High Voltage Committee – Tom Talor (Boeing) Committee Chair
 ASTM - ASTM F2840-14
 Automotive ISO 21498-1 & -2
 EUROCAE WG-116 High Voltage systems and Components in Aircraft Chairman Remy BIAJUAD, Safran

Initial Documentation

Documents	Intended Use
Change 1 to DO-160G/ED-14G	Basis for Revision H development
DO-357/ED-234 User Guide for DO-160G/ED-14G	Basis for User Guide for DO-160 Revision H development
SAE ARP 5412 Lightning Environment and Test Waveforms	Sections 22 and 23 environmental conditions definition
FAA Flammability AC and Handbook	Section 26 test conditions and procedures
DO-160 – Bob Saffel’s Document: Applying RTCA DO-160() Environmental Conditions and Test Procedures for Airborne Equipment	Guidance for incorporating environmental test requirements in MOPS

TERMINATION:

When the scope of this Terms of Reference is complete, the committee will recommend to the PMC that the committee Sunset, go into Active Monitoring Mode, or spend a period of time in Hiatus. Any change/extension of a committee’s work program requires prior PMC approval.