TERMS OF REFERENCE
Special Committee (SC) 135
Environmental Testing
(Revision 12-16-2014)

REQUESTOR:

<table>
<thead>
<tr>
<th>Organization</th>
<th>Person</th>
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<tbody>
<tr>
<td>Established 1975</td>
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</table>

SC LEADERSHIP:

<table>
<thead>
<tr>
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<th>email</th>
<th>Change</th>
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</thead>
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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:

<table>
<thead>
<tr>
<th>Product</th>
<th>Description</th>
<th>SC Completion Date</th>
<th>Change</th>
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<tbody>
<tr>
<td>Change 1 to DO-160G</td>
<td></td>
<td>Published</td>
<td></td>
</tr>
<tr>
<td>DO-160H - Environmental Conditions and Test Procedures For Airborne Equipment</td>
<td>Minimum Standard Environmental Test Conditions (categories) and Applicable Test Procedures for Airborne Equipment</td>
<td>12/2019</td>
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SCOPE:

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, and to break section 16 into multiple sections one for AC power systems and the other for DC power systems, and to break sections into emissions and susceptibility.

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. Setup a new section and a new Working Group to address Ground Reference Fluctuation which is a phenomenon aggravated by the combination of more composite structure and more electrical aircraft.

o. 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.

p. Investigate to replace 19.3.5 with a test procedure similar to MIL STD 461 CS115.

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 AdvisoryCirculars

FAA Technical Standard Orders (TSO’s)

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

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

Initial Documentation

<table>
<thead>
<tr>
<th>Documents</th>
<th>Intended Use</th>
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<tbody>
<tr>
<td>Change 1 to DO-160G/ED-14G</td>
<td>Basis for Revision H development</td>
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<tr>
<td>SAE ARP 5412 Lightning Environment and Test Waveforms</td>
<td>Sections 22, and 23 environmental conditions definition</td>
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<tr>
<td>FAA Flammability AC and Handbook</td>
<td>Section 26 test conditions and procedures</td>
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<tr>
<td>DO-160 – Bob Saffel’s Document: Applying RTCA DO-160() Environmental Conditions and Test Procedures for Airborne Equipment</td>
<td>Guidance for incorporating environmental test requirements in MOPS</td>
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TERMINATION:
Activities of Special Committee 135 will terminate with approval by the PMC of the committee’s final document listed above. Any change/extension of a committee’s work program requires prior PMC approval.