TERMS OF REFERENCE
Special Committee (SC) 230 Airborne Weather Detection Systems
Revision 2

REQUESTORS:

<table>
<thead>
<tr>
<th>Organization</th>
<th>Person</th>
</tr>
</thead>
<tbody>
<tr>
<td>FAA Associate Administrator for Aviation Safety</td>
<td>Ms. Peggy Gilligan</td>
</tr>
</tbody>
</table>

SC LEADERSHIP:

<table>
<thead>
<tr>
<th>Position</th>
<th>Name</th>
<th>Affiliation</th>
<th>Telephone</th>
<th>email</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Co-Chair</td>
<td>Dawn Gidner</td>
<td>Honeywell International</td>
<td>425.376.2071</td>
<td><a href="mailto:Dawn.Gidner@honeywell.com">Dawn.Gidner@honeywell.com</a></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Jeff Finley</td>
<td>Rockwell Collins</td>
<td>319.295.3247</td>
<td><a href="mailto:Jeffery.Finley@rockwellcollins.com">Jeffery.Finley@rockwellcollins.com</a></td>
<td></td>
</tr>
<tr>
<td>DFO</td>
<td>Lee Nguyen</td>
<td>FAA AIR-130</td>
<td>202.385.4676</td>
<td><a href="mailto:lee.nguyen@faa.gov">lee.nguyen@faa.gov</a></td>
<td></td>
</tr>
</tbody>
</table>

BACKGROUND:

RTCA/DO-220 provides the current Minimum Operational Performance Standards for Airborne Weather Radar with Forward-Looking Windshear Capability. It was published in 1993, with Change 1 added in 1995. Since then, significant technological advances in weather radar systems have occurred, but the MOPS has not been updated to accommodate these improvements. Modern weather radar systems may also include turbulence detection or other related features and functions that are not currently addressed by the MOPS. Revised guidance will enable a more efficient and standardized certification approach across the industry.

In April 2013, the FAA tasked an Industry Working Group to develop recommendations for an advisory circular for airworthiness approval for aircraft weather radar systems. The Industry Working Group recommends revising the outdated RTCA/DO-220, and DO-220 Change 1 to update the minimum operational performance standards for aircraft weather radar equipment.

(2015-03-17) - During the plenary meetings of SC-230, various committee members requested that the committee consider also revising DO-213, Minimum Operational Performance Standards for Nose-Mounted Radomes. The committee leadership agrees that DO-213 should be updated, and that it is appropriate to include that task under the Terms of Reference for SC-230.

(2015-06-16) - At the SC-230s fourth plenary meeting, the committee discussed the EUROCAE Working
Group 95 (WG-95) new subgroup for long-range awareness of icing conditions.

WG-95 subgroup will create a report on the feasibility to standardize In-Flight Ice Crystals Long Range Awareness capabilities by Weather Radar (WXR), with at least the following objectives:

1) Take into account the impact of the new icing atmosphere characterized by the Appendix “D/P” definition introducing the Ice Crystals and mixed Icing conditions.

2) Describe intended function of Ice Crystals Long Range Icing Awareness functionality by Weather Radar and the Operational need of such function.

3) Identify possible standardization activities of short term functionalities, with the definition of minimum acceptable performance and validation and verification approach.

4) After 12 months, describe the maturity of the Ice Crystals Long Range Icing Awareness function by Weather Radar and provide recommendations on the way forward of the sub-group and the way to standardize Icing WXR functions using new or existing EUROCAE / RTCA documents.

The RTCA SC-230 members have expressed an interest in supporting this activity and would like to contribute to the feasibility report in a first step.

In order to accommodate this interest from SC-230 members, the leadership of SC-230 agrees that the duties of this committee should be extended beyond the publication of DO-220A and DO-213A, to allow SC-230 to contribute to the long-range icing awareness feasibility report as described above.

DELIVERABLES:

<table>
<thead>
<tr>
<th>Product</th>
<th>Description</th>
<th>Due Date</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Revised DO-220</td>
<td>Revise DO-220, and DO-220 Change 1, Minimum Operational Performance Standard (MOPS) for Aircraft Weather Radar Equipment</td>
<td>November 2015</td>
<td></td>
</tr>
<tr>
<td>Revised DO-213</td>
<td>Revise DO-213 and DO-213 Change 1, Minimum Operational Performance Standards for Nose-Mounted Radomes</td>
<td>November 2015</td>
<td></td>
</tr>
</tbody>
</table>

SCOPE and COORDINATION:

Revise RTCA/DO-220 (1993), and DO-220 Change 1 (1995), Minimum Operational Performance Standards for Airborne Weather Radar with Forward-Looking Windshear Capability, to accommodate current weather radar technology, to add performance standards for forward-looking turbulence detection, and to correct errata and clarify confusing or inadequate requirements in the current version. Aircraft weather radar systems may include any of the following functions or combinations thereof, including
related functions or features:

a. Weather and ground mapping radar.
b. Weather radar with forward-looking turbulence detection.
c. Weather radar with forward-looking windshear detection.


Develop a report on the feasibility to standardize In-Flight Ice Crystals Long Range Awareness capabilities by Weather Radar (WXR), jointly with EUROCAE WG-95, and consider opportunities for future changes or updates to DO-220A and/or DO-213A based on the findings of this report.

ENVISIONED USE OF DELIVERABLE(S)

The anticipated implementation of the updated DO-220 will be referenced by the FAA in a revision to TSO-C63d, Airborne Weather Radar Equipment.

DO-213 is referenced by DO-220, Advisory Circular 21-182, and by TSO-C63d.

The revised standards will be useful to designers, equipment manufacturers, aircraft manufacturers, airlines and aircraft operators, installers, repair stations, and aviation authorities concerned with the design and approval of aircraft weather radar systems.

The Recommendations on the Feasibility to Standardize In-Flight Radar Long Range Ice Crystals Weather Awareness Function Interim Report will provide preliminary guidance for the definition of the intended function and operational concept of the Ice Crystals Long Range Awareness functionality, along with possible recommendations for design and validation of the function. This report will provide recommendations on the content of potential future standardization activities, and a means to standardize icing-related WXR functions using new or existing EUROCAE / RTCA documents.
SPECIFIC GUIDANCE:

The revised MOPS will address robust airborne weather radar system functions and performance requirements for modern radars, while retaining requirements that are still applicable to old-technology systems (with clarifications or revisions as needed).

The special committee will:

For DO-220:

- Update references as needed (for example, the current revision references RTCA/DO-160C)
- Implement clarifications as identified in TSO-C63d, Appendix 2
- Address other clarifications and corrections, including but not limited to:
  a. Correct known errata and clarify confusing or inadequate requirements.
  b. Specify the required characteristics of the airports used for collecting data for the superposition scenarios.
  c. Specify the required characteristics of the airports used in evaluating the forward-looking windshear system’s ability to reject spurious conditions.
- Add performance requirements for forward-looking turbulence detection. (Use TSO-C63d, Appendix 1 as the initial source of turbulence requirements, with improvements or additions as required).
- Consider whether or not to specifically address possible new functionalities such as (but not limited to) 3-D weather and vertical display of weather.
- In conjunction with developing these updates to RTCA/DO-220, the special committee will review and consider the following, among others:
  d. Technical Standard Order (TSO)-C63d, Airborne Weather Radar Equipment,
  e. RTCA/DO-173 (1980), Minimum Operational Performance Standards for Airborne Weather and Ground Mapping Pulsed Radars,
  g. RTCA/DO-213, Minimum Operational Performance Standards for Nose-Mounted Radomes,

For DO-213:

- Incorporate previous changes as appropriate
- Update references as needed
- Implement clarifications, updates, and corrections

For the Interim Report:

- Work jointly with the EUROCAE WG-95 Long Range Awareness sub-group.
ICC Coordination – The special committee will inform the Integration and Coordination Committee (ICC) of the committee’s intentions through the Program Management Committee.

Coordination with RTCA SC-206, Aeronautical Information and Meteorological Data Link Services, if and as appropriate.

EUROCAE Coordination – This is an independent advisory committee, not a joint RTCA/EUROCAE committee. Coordination with EUROCAE will be undertaken, as appropriate.

Initial Documentation

<table>
<thead>
<tr>
<th>Documents</th>
<th>Intended Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>RTCA/DO-220</td>
<td>Review and use as baseline</td>
</tr>
<tr>
<td>RTCA/DO-220, Change 1</td>
<td>Review and use as baseline</td>
</tr>
<tr>
<td>TSO-C63d</td>
<td>Review; Initial source of turbulence requirements</td>
</tr>
<tr>
<td>RTCA/DO-213 with Change 1 (1995)</td>
<td>Review and use as baseline</td>
</tr>
</tbody>
</table>

TERMINATION:

Activities of this Special Committee SC-230 will terminate with approval by the Program Management Committee (PMC) of the committee’s final documents listed in the Terms of Reference. Any change/extension of a committee’s work program requires prior PMC approval.